

## ANTHROPOLOGY

**Shockley, M., Lesnik, J., Allen, R. N., & Muñoz, A. F. (2018). Edible insects and their uses in north America: Past, present and future. In A. Halloran, R. Flore, P. Vantomme, & N. Roos (Eds.), Edible Insects in Sustainable Food Systems (pp. 55-79). Cham, Switzerland: Springer.**

[http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053367336&doi=10.1007%2f978-3-319-74011-9\\_4&partnerID=40&md5=c97caefc413e0cdb263f647753a8987a](http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053367336&doi=10.1007%2f978-3-319-74011-9_4&partnerID=40&md5=c97caefc413e0cdb263f647753a8987a)

Insects have been an important part of food culture for many different places and peoples across North America's history. This chapter retraces the indigenous uses of insects as a food across the continent, through modern Mexico and into the present day movement to bring these ingredients into the culinary landscape of the United States of America and Canada. The authors provide an overview of the practices and uses of insects as food in both whole and traditional forms, and newer abstractions of the insects into consumer facing snack food products. In addition, the ways in which these startup farms and product makers are using insects for food are discussed, including facets such as crowdfunding, processing and marketing, as well as evidence from the culinary and celebrity worlds that entomophagy is gaining traction in North America. © Springer International Publishing AG, part of Springer Nature 2018. All rights are reserved.

**Ryzewski, K., Cherry, J. F., & McAtackney, L. (2018). "The State of Decay into which the Island Has Fallen": Education and Social Welfare on Montserrat after emancipation. *International Journal of Historical Archaeology*. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056403635&doi=10.1007%2fs10761-018-0478-x&partnerID=40&md5=3674dc755814b5d10adf989a8f0b34a8>**

The social life of the newly created 'laboring classes' in the post-emancipation Caribbean has been relatively unexamined across a number of disciplinary perspectives. This paper argues for the need to bring together a variety of sources to enable researchers to gain a better understanding of this important, transitional time in Montserrat's history. Using evidence gathered from archives in the Caribbean, North America and the British Isles, materials excavated from a previously undocumented schoolhouse structure in the north of the island, and local memories of education on Montserrat, this paper illuminates an almost forgotten aspect of the lives of nineteenth-century laboring classes: the aspiration of education. © 2018, Springer Science+Business Media, LLC, part of Springer Nature.

## BIOLOGICAL SCIENCES

**Aretakis, J. R., Al-Husini, N., & Schrader, J. M. (2018). Methodology for Ribosome Profiling of Key Stages of the *Caulobacter crescentus* Cell Cycle. *Methods in Enzymology*, (article in press).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052730152&doi=10.1016%2fbs.mie.2018.07.008&partnerID=40&md5=519ad92325eca3d42e2a1f26817340bb>

Bacterial cell division is the result of a productive round of the cell cycle to yield two daughter cells. The cell cycle is highly coordinated in *Caulobacter crescentus* where it is driven by a cell cycle gene-regulatory network that coordinates gene expression with the major cell cycle events such as chromosome replication and cell

division. Recent ribosomes profiling data showed that 484 genes undergo changes in translation efficiency during the cell cycle, suggesting a broad role for translational control in cell cycle regulation. In this chapter, we focus on how to perform ribosome profiling to measure the translation efficiency across cellular mRNAs at key stages in the *Caulobacter* cell cycle. This methodology relies on the high-yield ludox gradient synchronization of *Caulobacter* cells followed by ribosome profiling to measure ribosome density and total RNA-seq to measure mRNA levels. © 2018 Elsevier Inc.

**Osborne, M. J., Sanchez, A. V., Dowling, T. E., & Turner, T. F. (2018). Variance in Reproductive Success is Driven by Environmental Factors, not Mating System, in Bonytails. Transactions of the American Fisheries Society, (article in press).** <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054067719&doi=10.1002%2ftafs.10105&partnerID=40&md5=75588777bb7bbb7d67729bf59eec8fb0>

Studying the reproductive ecology of aggregate broadcast-spawning fishes is difficult because it is generally not feasible to sample all potential parents and unambiguously assign their offspring. We used molecular-based parentage analysis to gain insights into the reproductive ecology of the endangered Bonytail *Gila elegans* and to evaluate whether protected off-channel habitats could be used as an alternative to hatchery production. By genotyping adults and offspring ( $n = 4,130$ ) that were stocked into two experimental backwaters across 3 years, we determined that most adults (82–97%) contributed to progeny production across years and backwaters, with one exception. Both sexes exhibited multiple matings, and the number of mates and family size were positively correlated. There was also a positive correlation between adult size and metrics of reproductive success. There were strong interactions between sample year and backwater, suggesting that environmental factors are the primary driver of variance in reproductive success. Knowledge of mating systems and sources of variance in reproductive success is important for management of endangered fish because high variance in reproductive success leads to substantial losses of genetic variation when few individuals reproduce successfully. Although variance in reproductive success was observed, most adults contributed to genetically diverse progeny in experimental backwaters. These results support the use of predator-free—but otherwise natural—backwaters as an effective conservation tool for reintroducing the Bonytail to its native habitat. © 2018 American Fisheries Society

**Al-Husini, N., Tomares, D. T., Bitar, O., Childers, W. S., & Schrader, J. M. (2018).  $\alpha$ -Proteobacterial RNA Degradosomes Assemble Liquid-Liquid Phase-Separated RNP Bodies. *Molecular Cell*, 71(6), 1027-1039.e1014.** <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056471544&doi=10.1016%2fj.molcel.2018.08.003&partnerID=40&md5=53686b44b084928f7255dd56353fb47e>

Ribonucleoprotein (RNP) granules play an important role in organizing eukaryotic mRNA metabolism via liquid-liquid phase separation (LLPS) of mRNA decay factors into membrane-less organelles in the cytoplasm. Here we show that the bacterium *Caulobacter crescentus* Ribonuclease (RNase) E assembles RNP LLPS condensates that we term bacterial RNP-bodies (BR-bodies), similar to eukaryotic P-bodies and stress granules. RNase E requires RNA to assemble a BR-body, and disassembly requires RNA cleavage, suggesting BR-bodies provide localized sites of RNA degradation. The unstructured C-terminal domain of RNase E is both necessary and sufficient to assemble the core of the BR-body, is functionally conserved in related  $\alpha$ -proteobacteria, and influences mRNA degradation. BR-bodies are rapidly induced under cellular stresses and provide enhanced cell growth under stress. To our knowledge, *Caulobacter* RNase E is the first bacterial protein identified that forms LLPS condensates, providing an effective strategy for subcellular organization in cells lacking membrane-bound

compartments. Al-Husini et al. show that the Caulobacter RNA degradosome assembles a liquid-liquid phase-separated (LLPS) biomolecular condensate “BR-body.” Caulobacter RNase E is the first protein of bacterial origin found to form LLPS, providing a useful mechanism for bacteria to organize their biochemical pathways in the absence of membrane-bound organelles. © 2018 Elsevier Inc.

**Armisen, D., Rajakumar, R., Friedrich, M., Benoit, J. B., Robertson, H. M., Panfilio, K. A., . . . Khila, A. (2018). The genome of the water strider *Gerris buenoi* reveals expansions of gene repertoires associated with adaptations to life on the water. *BMC genomics*, 19(1), 832.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056975049&doi=10.1186%2fs12864-018-5163-2&partnerID=40&md5=2a120d0a2a9dbdb056d1528e9350fd81>

**BACKGROUND:** Having conquered water surfaces worldwide, the semi-aquatic bugs occupy ponds, streams, lakes, mangroves, and even open oceans. The diversity of this group has inspired a range of scientific studies from ecology and evolution to developmental genetics and hydrodynamics of fluid locomotion. However, the lack of a representative water strider genome hinders our ability to more thoroughly investigate the molecular mechanisms underlying the processes of adaptation and diversification within this group. **RESULTS:** Here we report the sequencing and manual annotation of the *Gerris buenoi* (*G. buenoi*) genome; the first water strider genome to be sequenced thus far. The size of the *G. buenoi* genome is approximately 1,000 Mb, and this sequencing effort has recovered 20,949 predicted protein-coding genes. Manual annotation uncovered a number of local (tandem and proximal) gene duplications and expansions of gene families known for their importance in a variety of processes associated with morphological and physiological adaptations to a water surface lifestyle. These expansions may affect key processes associated with growth, vision, desiccation resistance, detoxification, olfaction and epigenetic regulation. Strikingly, the *G. buenoi* genome contains three insulin receptors, suggesting key changes in the rewiring and function of the insulin pathway. Other genomic changes affecting with opsin genes may be associated with wavelength sensitivity shifts in opsins, which is likely to be key in facilitating specific adaptations in vision for diverse water habitats. **CONCLUSIONS:** Our findings suggest that local gene duplications might have played an important role during the evolution of water striders. Along with these findings, the sequencing of the *G. buenoi* genome now provides us the opportunity to pursue exciting research opportunities to further understand the genomic underpinnings of traits associated with the extreme body plan and life history of water striders.

**Barnes, V. L., Laity, K. A., Pilecki, M., & Pile, L. A. (2018). Systematic Analysis of SIN3 Histone Modifying Complex Components During Development. *Scientific Reports*, 8(1).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056737969&doi=10.1038%2fs41598-018-35093-0&partnerID=40&md5=d77d178964a13c5ddc26bd3adb184e47>

Establishment and maintenance of histone acetylation levels are critical for metazoan development and viability. Disruption of the balance between acetylation and deacetylation by treatment with chemical histone deacetylase (HDAC) inhibitors results in loss of cell proliferation, differentiation and/or apoptosis. Histone deacetylation by the SIN3 complex is essential in *Drosophila* and mice, as loss of the scaffolding factor SIN3 or the associated HDAC results in lethality. The objective of this study is to elucidate contributions of SIN3 complex components to these essential processes. We used the *Drosophila* model organism to carry out a systematic functional analysis of the SIN3 complex. We find that SIN3 associated proteins are essential for viability and cell proliferation during development. Additionally, tissue specific reduction of SIN3 complex components results in abnormal wing development. Interestingly, while knockdown of each factor resulted in similar phenotypes, their

individual effects on recruitment of SIN3 to polytene chromosomes are distinct. Reduction of some factors leads to large changes in the morphology of the chromosome and/or greatly reduced SIN3 binding. These findings suggest that while individual SIN3 complex components work through distinct molecular mechanisms, they each make a substantial contribution to the overall function of this highly conserved histone deacetylase complex. © 2018, The Author(s).

**Indra, I., Gasparski, A. N., & Beningo, K. A. (2018). An in vitro correlation of metastatic capacity and dual mechanostimulation. *PLoS one*, 13(11), e0207490.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056619993&doi=10.1371%2fjournal.pone.0207490&partnerID=40&md5=10549098c2de16c1c42fa97e941cad57>

Cells are under the influence of multiple forms of mechanical stimulation in vivo. For example, a cell is subjected to mechanical forces from tissue stiffness, shear and tensile stress and transient applied strain. Significant progress has been made in understanding the cellular mechanotransduction mechanisms in response to a single mechanical parameter. However, our knowledge of how a cell responds to multiple mechanical inputs is currently limited. In this study, we have tested the cellular response to the simultaneous application of two mechanical inputs: substrate compliance and transient tugging. Our results suggest that cells within a multicellular spheroid will restrict their response to a single mechanical input at a time and when provided with two mechanical inputs simultaneously, one will dominate. In normal and non-metastatic mammary epithelial cells, we found that they respond to applied stimulation and will override substrate compliance cues in favor of the applied mechanical stimulus. Surprisingly, however, metastatic mammary epithelial cells remain non-responsive to both mechanical cues. Our results suggest that, within our assay system, metastatic progression may involve the down-regulation of multiple mechanotransduction pathways.

**Samrat, S. K., & Gu, H. (2018). Temporal Analysis of the Nuclear-to-cytoplasmic Translocation of a Herpes Simplex Virus 1 Protein by Immunofluorescent Confocal Microscopy. *Journal of visualized experiments : JoVE*(141).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056713829&doi=10.3791%2f58504&partnerID=40&md5=ca87d0f19c5442ff75f7f51585186bcc>

Infected cell protein 0 (ICP0) of herpes simplex virus 1 (HSV-1) is an immediate early protein containing a RING-type E3 ubiquitin ligase. It is responsible for the proteasomal degradation of host restrictive factors and the subsequent viral gene activation. ICP0 contains a canonical nuclear localization sequence (NLS). It enters the nucleus immediately after de novo synthesis and executes its anti-host defense functions mainly in the nucleus. However, later in infection, ICP0 is found solely in the cytoplasm, suggesting the occurrence of a nuclear-to-cytoplasmic translocation during HSV-1 infection. Presumably ICP0 translocation enables ICP0 to modulate its functions according to its subcellular locations at different infection phases. In order to delineate the biological function and regulatory mechanism of ICP0 nuclear-to-cytoplasmic translocation, we modified an immunofluorescent microscopy method to monitor ICP0 trafficking during HSV-1 infection. This protocol involves immunofluorescent staining, confocal microscope imaging, and nuclear vs. cytoplasmic distribution analysis. The goal of this protocol is to adapt the steady state confocal images taken in a time course into a quantitative documentation of ICP0 movement throughout the lytic infection. We propose that this method can be generalized to quantitatively analyze nuclear vs. cytoplasmic localization of other viral or cellular proteins without involving live imaging technology.

**Sujkowski, A., Spierer, A. N., Rajagopalan, T., Bazzell, B., Safdar, M., Imsirovic, D., . . . Wessells, R. (2018). Mito-nuclear interactions modify *Drosophila* exercise performance. *Mitochondrion*.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056278553&doi=10.1016%2fj.mito.2018.11.005&partnerID=40&md5=dee9f87a5c28bb85c26bc32d12bb521c>

Endurance exercise has received increasing attention as a broadly preventative measure against age-related disease and dysfunction. Improvement of mitochondrial quality by enhancement of mitochondrial turnover is thought to be among the important molecular mechanisms underpinning the benefits of exercise. Interactions between the mitochondrial and nuclear genomes are important components of the genetic basis for variation in longevity, fitness and the incidence of disease. Here, we examine the effects of replacing the mitochondrial genome (mtDNA) of several *Drosophila* strains with mtDNA from other strains, or from closely related species, on exercise performance. We find that mitochondria from flies selected for longevity increase the performance of flies from a parental strain. We also find evidence that mitochondria from other strains or species alter exercise performance, with examples of both beneficial and deleterious effects. These findings suggest that both the mitochondrial and nuclear genomes, as well as interactions between the two, contribute significantly to exercise capacity. © 2018 Elsevier B.V. and Mitochondria Research Society

**Vijayavel, K., & Kashian, D. R. (2018). Toxic effect and physiological disruption of sodium phosphate to the quagga mussel (*Dreissena bugensis*). *Environmental Science and Pollution Research*.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056705629&doi=10.1007%2fs11356-018-3720-5&partnerID=40&md5=6af80db36f135b35caa39506c4ed4fa7>

Phosphorous is an essential nutrient for all forms of life; however, the question of toxicity to aquatic species remains largely unanswered, despite many systems that exceed natural phosphorus loads. This study determined the ecotoxicological threshold concentration of phosphorus to the freshwater bivalve *Dreissena bugensis* using a 96-h bioassay. Sublethal, medial lethal, and lethal levels of sodium phosphate to *D. bugensis* were found to be 125, 260, and 476 ppm. Physiological biomarkers such as the oxygen consumption and filtration rate were estimated by exposing *D. bugensis* to five different sublethal concentrations (25, 50, 75, 100, and 125 ppm) of sodium phosphate for 96 h. Both oxygen consumption and filtration rate gradually declined with increasing exposure concentrations and durations, which was significant ( $\alpha < 0.05$ ) for 75, 100, and 125 ppm of sodium phosphate concentrations. Based on the feeding rate and oxygen consumption endpoints, the no-observed effect concentration and the low observed effect concentration were 25 and 75 ppm, respectively. Maximum acceptable toxicant concentration of sodium phosphate was 43.3 ppm. Measured environmental concentration (MEC) of total phosphorus (0.015 ppm;  $n = 6$ ) was obtained from seasonal field assessments in Saginaw Bay during the years 2008 to 2010. An assessment factor of 1000 was used for calculating the predicted no effect concentration (PNEC) of 0.025 ppm. Risk quotient (RQ) of "0.6" was therefore established using MEC/PNEC (real risk) ratio. Binary ecological classification ( $RQ < 1$ ) suggested that there is no appreciable risk of phosphorus to *D. bugensis* in the Saginaw Bay of Lake Huron of Laurentian Great Lakes. © 2018, Springer-Verlag GmbH Germany, part of Springer Nature.

## CHEMISTRY

**Adero, P. O., Amarasekara, H., Wen, P., Bohé, L., & Crich, D. (2018). The Experimental Evidence in Support of Glycosylation Mechanisms at the SN1-SN2 Interface. *Chemical Reviews*, 118(17), 8242-8284.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053203701&doi=10.1021%2facs.chemrev.8b00083&partnerID=40&md5=51cdc5e5fe598b3bcfa21c727dab948d>

A critical review of the state-of-the-art evidence in support of the mechanisms of glycosylation reactions is provided. Factors affecting the stability of putative oxocarbenium ions as intermediates at the SN1 end of the mechanistic continuum are first surveyed before the evidence, spectroscopic and indirect, for the existence of such species on the time scale of glycosylation reactions is presented. Current models for diastereoselectivity in nucleophilic attack on oxocarbenium ions are then described. Evidence in support of the intermediacy of activated covalent glycosyl donors is reviewed, before the influences of the structure of the nucleophile, of the solvent, of temperature, and of donor-acceptor hydrogen bonding on the mechanism of glycosylation reactions are surveyed. Studies on the kinetics of glycosylation reactions and the use of kinetic isotope effects for the determination of transition-state structure are presented, before computational models are finally surveyed. The review concludes with a critical appraisal of the state of the art. © 2018 American Chemical Society.

**Arbour, C. A., & Stockdill, J. L. (2018). A mild capping method for SPPS on the N-methyl diaminobenzoyl linker: Synthesis of an N-acyl urea appended C. elegans neuropeptide. Tetrahedron Letters, 59(4), 3903-3906.** <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053940077&doi=10.1016%2fj.tetlet.2018.08.061&partnerID=40&md5=f74e4fab0a402d531f03f489919ec7ac>

In this manuscript, we establish the susceptibility of the N-methyldiaminobenzoyl linker to undergo undesired acylation during standard peptide capping with acetic anhydride. Successive capping treatments led to problematic levels of linker incapacitation. We describe a mild, inexpensive alternative capping strategy that is completely selective for the N terminus with no acylation of the linker detected for any of the substrates evaluated. The utility of this protocol is demonstrated via the synthesis of the CAPA-PVK-1 consensus sequence of the C. elegans neuropeptide-like protein precursor peptide NLP-44. © 2018

**He, C. C., Hamlow, L. A., Devereaux, Z. J., Zhu, Y., Nei, Y. W., Fan, L., . . . Rodgers, M. T. (2018). Structural and Energetic Effects of O2'-Ribose Methylation of Protonated Purine Nucleosides. Journal of Physical Chemistry B, (article in press).** <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054141694&doi=10.1021%2facs.jpcc.8b07687&partnerID=40&md5=3155262704c0fcf47cf6ca27c1a50726>

The chemical difference between DNA and RNA nucleosides is their 2'-hydrogen versus 2'-hydroxyl substituents. Modification of the ribosyl moiety at the 2'-position and 2'-O-methylation in particular, is common among natural post-transcriptional modifications of RNA. 2'-Modification may alter the electronic properties and hydrogen-bonding characteristics of the nucleoside and thus may lead to enhanced stabilization or malfunction. The structures and relative glycosidic bond stabilities of the protonated forms of the 2'-O-methylated purine nucleosides, 2'-O-methyladenosine (Adom) and 2'-O-methylguanosine (Guom), were examined using two complementary tandem mass spectrometry approaches, infrared multiple photon dissociation action spectroscopy and energy-resolved collision-induced dissociation. Theoretical calculations were also performed to predict the structures and relative stabilities of stable low-energy conformations of the protonated forms of the 2'-O-methylated purine nucleosides and their infrared spectra in the gas phase. Low-energy conformations highly parallel to those found for the protonated forms of the canonical DNA and RNA purine nucleosides are also found for the protonated 2'-O-methylated purine nucleosides. Importantly, the preferred site of protonation, nucleobase orientation, and sugar puckering are preserved among the DNA, RNA, and 2'-O-methylated variants of the protonated purine nucleosides. The 2'-substituent does however influence hydrogen-bond stabilization as the 2'-O-methyl and 2'-hydroxyl substituents enable a hydrogen-bonding interaction

between the 2'- and 3'-substituents, whereas a 2'-hydrogen atom does not. Further, 2'-O-methylation reduces the number of stable low-energy hydrogen-bonded conformations possible and importantly inverts the preferred polarity of this interaction versus that of the RNA analogues. Trends in the CID50% values extracted from survival yield analyses of the 2'-O-methylated and canonical DNA and RNA forms of the protonated purine nucleosides are employed to elucidate their relative glycosidic bond stabilities. The glycosidic bond stability of Adom is found to exceed that of its DNA and RNA analogues. The glycosidic bond stability of Guom is also found to exceed that of its DNA analogue; however, this modification weakens this bond relative to its RNA counterpart. The glycosidic bond stability of the protonated purine nucleosides appears to be correlated with the hydrogen-bond stabilization of the sugar moiety. Copyright © 2018 American Chemical Society.

**Patel, K., Ahmed, Z. S., Huang, X., Yang, Q., Ekinci, E., Neslund-Dudas, C. M., . . . Dou, Q. P. (2018). Discovering proteasomal deubiquitinating enzyme inhibitors for cancer therapy: Lessons from rational design, nature and old drug reposition. *Future Medicinal Chemistry*, 10(17), 2087-2108.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052697370&doi=10.4155%2ffmc-2018-0091&partnerID=40&md5=186e01fb05fa83f164a32a63688240e1>

The ubiquitin proteasome system has been validated as a target of cancer therapies evident by the US FDA approval of anticancer 20S proteasome inhibitors. Deubiquitinating enzymes (DUBs), an essential component of the ubiquitin proteasome system, regulate cellular processes through the removal of ubiquitin from ubiquitinated-tagged proteins. The deubiquitination process has been linked with cancer and other pathologies. As such, the study of proteasomal DUBs and their inhibitors has garnered interest as a novel strategy to improve current cancer therapies, especially for cancers resistant to 20S proteasome inhibitors. This article reviews proteasomal DUB inhibitors in the context of: discovery through rational design approach, discovery from searching natural products and discovery from repurposing old drugs, and offers a future perspective. © 2018 2018 Newlands Press.

**Trimpin, S., Pophristic, M., Adeniji-Adele, A., Tomsho, J. W., & McEwen, C. N. (2018). Vacuum Matrix-Assisted Ionization Source Offering Simplicity, Sensitivity, and Exceptional Robustness in Mass Spectrometry. *Analytical Chemistry*, (article in press).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053629113&doi=10.1021%2ffacs.analchem.8b03378&partnerID=40&md5=bb23d1152ad891368bed41cd1a76dea9>

Vacuum matrix-assisted ionization (vMAI) uses select matrix compounds which when exposed to the vacuum of a mass spectrometer produce gas-phase ions from associated volatile or nonvolatile analyte without external energy input. Here, a vMAI source was constructed to replace the commercial inlet of a Thermo Orbitrap mass spectrometer. This allowed for rapid introduction of the matrix/analyte sample by a probe, contrary to vacuum matrix-assisted laser desorption/ionization (MALDI) sources. The matrix/analyte sample is inserted into a region of the "S-lens" entrance, where the spontaneously formed ions can be effectively transferred to the mass analyzer. This specifically designed ion source requires no laser, high voltage, heat, or nebulizing gases. A low voltage is used to transmit the ions through the commercial "S-lens" assembly and airflow can be used to modulate the ionization event. A few picograms of the drug erythromycin, assisted by the 3-nitrobenzonitrile vMAI matrix, is sufficient to produce mass spectra for over 1 min with the MH<sup>+</sup> ion as the base peak in each mass spectrum. There is minimal carryover when loading high concentration samples and complex mixtures,

contrary to direct infusion electrospray ionization, providing the probe is thoroughly cleaned between each new sample acquisition. Analyses of biological fluids, bacterial extracts, tissue, and high concentration samples have so far shown no indication of inlet or instrument contamination with these samples. The typical ultrahigh resolution and mass accuracy of the mass spectrometer are achieved, and a path forward to potential high throughput acquisitions demonstrated. It is expected that robustness can be introduced to any mass spectrometer through implementation of such a simple source. © 2018 American Chemical Society.

**Wang, D., Ekanayake, D. M., Lindeman, S. V., Verani, C. N., & Fiedler, A. T. (2018). Multielectron Redox Chemistry of Transition Metal Complexes Supported by a Non-Innocent N3P2 Ligand: Synthesis, Characterization, and Catalytic Properties. European Journal of Inorganic Chemistry, (article in press).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053898472&doi=10.1002%2fejic.201800843&partnerID=40&md5=37ef77f0411be1e14782dcbe79003520>

A new redox-active, diarylamido-based ligand (LN3P2) capable of  $\kappa^5$ -N,N,N,P chelation has been used to prepare a series of complexes with the general formula  $[M^{II}(LN3P2)]X$ , where M = Fe (1; X = OTf), Co (2; X = ClO<sub>4</sub>), or Ni (3; X = ClO<sub>4</sub>). The diarylamido core of monoanionic LN3P2 is derived from bis(2-amino-4-methylphenyl)amine, which undergoes condensation with two equivalents of 2-(diphenylphosphanyl)benzaldehyde to provide chelating arms with both arylphosphine and imine donors. X-ray structural, magnetic, and spectroscopic studies indicate that the N3P2 coordination environment generally promotes low-spin configurations. Three quasi-reversible redox couples between +1.0 and –1.5 V (vs. Fc<sup>+</sup>/Fc) were observed in voltammetric studies of each complex, corresponding to M<sup>II</sup>/M<sup>III</sup> oxidation, LN3P2-based oxidation, and M<sup>II</sup>/M<sup>I</sup> reduction (in order of highest to lowest potential). Spectroscopic and computational analyses of 3ox – generated via chemical one-electron oxidation of 3 – revealed that a stable diarylaminy radical (LN3P2·) is formed upon oxidation. The ability of the Co<sup>II</sup> complex (2) to function as an electrocatalyst for H<sub>2</sub> generation was evaluated in the presence of weak acids. Moderate activity was observed using 4-tert-butylphenol as the proton source at potentials below –2.0 V. The insights gained here will assist in the future design of pentadentate mixed N/P-based chelates for catalytic processes. © 2018 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim

**Wang, R., & Chernyak, V. Y. (2018). Dynamical consequences of time-reversal symmetry for systems with odd number of electrons: Conical intersections, semiclassical dynamics, and topology. Chemical Physics, (article in press).** <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054033542&doi=10.1016%2fj.chemphys.2018.09.026&partnerID=40&md5=c7ce486b905eba8723130906fd7563e9>

In this manuscript we identify the main differences between the effects of Kramers symmetry on the systems with even and odd number of electrons, the ways how the aforementioned symmetry affects the structure of the Conical Seams (CSs), and how it shows up in semiclassical propagation of nuclear wavepackets, crossing the CSs. We identify the topological invariants, associated with CSs, in three cases: even and odd number of electrons with time-reversal symmetry, as well as absence of the latter. We obtain asymptotically exact semiclassical analytical solutions for wavepackets scattered on a CS for all three cases, identify topological features in a non-trivial shape of the scattered wavepacket, and connect them to the topological invariants, associated with CSs. We argue that, due to robustness of topology, the non-trivial wavepacket structure is a



topologically protected evidence of a wavepacket having passed through a CS, rather than a feature of a semiclassical approximation. © 2018

**Weeraratna, C., Amarasinghe, C., Lee, S. K., Li, W., & Suits, A. G. (2018). Demonstration of multi-hit and multi-mass capability of 3D imaging in a conventional velocity map imaging experiment. *Journal of Chemical Physics*, 149(8). <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052759894&doi=10.1063%2f1.5040589&partnerID=40&md5=6ca8ea646cd30ae3e26b38cbe8410e52>**

Coincidence and three-dimensional (3D) imaging offer unique capability in photodissociation and scattering experiments, and a variety of methods have been developed. The basic concept behind all these approaches is to register both the position (x, y) at which the particle hits the detector and the arrival time (t). A novel advance to the time and position sensitive detection was introduced recently by Li and co-workers [Rev. Sci. Instrum. 85(12), 123303 (2014)]. This method utilizes a high-speed digitizer and a computer algorithm along with the camera and detector usually employed in a conventional velocity map imaging apparatus. Due to the normal intensity variations of the ion spots, a correlation can be made between ion intensity recorded by the camera and peak intensity in the digitizer. This makes it possible to associate each ion spot's position with its respective arrival time, thereby constructing a 3D distribution. The technique was primarily introduced for ultrafast ion and electron imaging experiments at high repetition rate with single or few events per image frame. We have recently succeeded in adapting this approach at low repetition rate. Modifications were done to the initial setup to enhance the acquisition efficiency to obtain and correlate multiple hits per laser shot rather than single-hit events. The results are demonstrated in two experiments, dimethyl amine dissociative ionization at 205 nm and carbonyl sulfide photodissociation at 217 nm, with up to 27 events correlated in a single frame. Temporal and spatial slicing capabilities were achieved with good resolution, giving the photofragment velocity and angular distribution for multiple masses simultaneously. © 2018 Author(s).

**Arora, K., Herroon, M., Al-Afyouni, M. H., Toupin, N. P., Rohrabough, T. N., Loftus, L. M., . . . Kodanko, J. J. (2018). Catch and Release Photosensitizers: Combining Dual-Action Ruthenium Complexes with Protease Inactivation for Targeting Invasive Cancers. *Journal of the American Chemical Society*. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055468080&doi=10.1021%2fjacs.8b08853&partnerID=40&md5=a99bd30f1c8a440d2f3c8690a23ea35f>**

Dual action agents containing a cysteine protease inhibitor and Ru-based photosensitizer for photodynamic therapy (PDT) were designed, synthesized, and validated in 2D culture and 3D functional imaging assays of triple-negative human breast cancer (TNBC). These combination agents deliver and release Ru-based PDT agents to tumor cells and cause cancer cell death upon irradiation with visible light, while at the same time inactivating cathepsin B (CTSB), a cysteine protease strongly associated with invasive and metastatic behavior. In total five Ru-based complexes were synthesized with the formula  $[\text{Ru}(\text{bpy})_2(1)](\text{O}_2\text{CCF}_3)_2$  (3), where bpy = 2,2'-bipyridine and 1 = a bipyridine-based epoxysuccinyl inhibitor;  $[\text{Ru}(\text{tpy})(\text{NN})(2)](\text{PF}_6)_2$ , where tpy = terpyridine, 2 = a pyridine-based epoxysuccinyl inhibitor and NN = 2,2'-bipyridine (4); 6,6'-dimethyl-2,2'-bipyridine (5); benzo[i]dipyrido[3,2-a:2',3'-c]phenazine (6); and 3,6-dimethylbenzo[i]dipyrido[3,2-a:2',3'-c]phenazine (7). Compound 3 contains a  $[\text{Ru}(\text{bpy})_3]^{2+}$  fluorophore and was designed to track the subcellular localization of the conjugates, whereas compounds 4-7 were designed to undergo either photoactivated ligand dissociation and/or singlet oxygen generation. Photochemical studies confirmed that complexes 5 and 7 undergo photoactivated ligand dissociation, whereas 6 and 7 generate singlet oxygen. Inhibitors 1-7 all potently and irreversibly inhibit CTSB. Compounds 4-7 were evaluated against MDA-MB-231 TNBC and MCF-10A breast epithelial cells in 2D and

3D culture for effects on proteolysis and cell viability under dark and light conditions. Collectively, these data reveal that 4-7 potently inhibit dye-quenched (DQ) collagen degradation, whereas only compound 7 causes efficient cell death under light conditions, consistent with its ability to release a Ru(II)-based photosensitizer and to also generate  $1O_2$ . Copyright © 2018 American Chemical Society.

**Dhakal, B., & Crich, D. (2018). Synthesis and Stereocontrolled Equatorially Selective Glycosylation Reactions of a Pseudaminic Acid Donor: Importance of the Side-Chain Conformation and Regioselective Reduction of Azide Protecting Groups. *Journal of the American Chemical Society*.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055655893&doi=10.1021%2Fjacs.8b09654&partnerID=40&md5=a8e3d2bcc683b9dcd2cca75cec94e206>

Pseudaminic acid is an amino deoxy sialic acid whose glycosides are essential components of many pathogenic Gram-negative bacterial cell walls including those from *Pseudomonas aeruginosa*, *Vibrio cholerae*, *Campylobacter jejuni*, *Campylobacter coli*, *Vibrio vulnificus*, and *Pseudoalteromonas distincta*. The study of pseudaminic acid glycosides is however hampered by poor availability from nature and the paucity of good synthetic methods and limited to no understanding of the factors controlling stereoselectivity. Conformational analysis of the side chains of various stereoisomeric sialic acids suggested that the side chain of pseudaminic acid would take up the most electron-withdrawing trans,gauche-conformation, as opposed to the gauche,gauche conformation of N-acetyl neuraminic acid and the gauche,trans-conformation of 7-epi N-acetyl neuraminic acid, leading to the prediction of high equatorial selectivity. This prediction is borne out by the synthesis of a suitably protected pseudaminic acid donor from N-acetyl neuraminic acid in 20 steps and 5% overall yield and by the exquisite equatorial selectivity it displays in coupling reactions with typical glycosyl acceptors. The selectivity of the glycosylation reactions is further buttressed by the development and implementation of conditions for the regioselective release of the two amines from the corresponding azides, such as required for the preparation of the lipopolysaccharides. These findings open the way to the synthesis and study of pseudaminic acid-based bacterial lipopolysaccharides and, importantly in the broader context of glycosylation reactions in general, underline the significant role played by side-chain conformation in the control of reactivity and selectivity. © 2018 American Chemical Society.

**Hamlow, L. A., Zhu, Y., Devereaux, Z. J., Cunningham, N. A., Berden, G., Oomens, J., & Rodgers, M. T. (2018). Modified Quadrupole Ion Trap Mass Spectrometer for Infrared Ion Spectroscopy: Application to Protonated Thiated Uridines. *Journal of the American Society for Mass Spectrometry*, 29(11), 2125-2137.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054896432&doi=10.1007%2Fs13361-018-2047-2&partnerID=40&md5=6cadc01366b19b1fe0ddc47a02aa8790>

Modifications to a Paul-type quadrupole ion trap mass spectrometer providing optical access to the trapped ion cloud as well as hardware and software for coupling to a table-top IR optical parametric oscillator laser (OPO) are detailed. Critical experimental parameters for infrared multiple photon dissociation (IRMPD) on this instrument are characterized. IRMPD action spectra, collected in the hydrogen-stretching region with this instrument, complemented by spectra in the IR fingerprint region acquired at the FELIX facility, are employed to characterize the structures of the protonated forms of 2-thiouridine,  $[s2Urd+H]^+$ , and 4-thiouridine,  $[s4Urd+H]^+$ . The measured spectra are compared with predicted linear IR spectra calculated at the B3LYP/6-311+G(d,p) level of theory to determine the conformers populated in the experiments. This comparison indicates that thiation at the 2- or 4-positions shifts the protonation preference between the 2,4-H tautomer and 4-protonation in opposite directions versus canonical uridine, which displays a roughly equal preference for the 2,4-H tautomer and O4 protonation. As found for canonical uridine, protonation leads to a mixture of conformers exhibiting C2'-endo and C3'-endo sugar puckering with an anti nucleobase orientation being populated for both 2- and 4-

thiated uridine. [Figure not available: see fulltext.]. © 2018, American Society for Mass Spectrometry.

Lu, H., Carroll, G. M., Chen, X., Amarasinghe, D. K., Neale, N. R., Miller, E. M., . . . Beard, M. C. (2018). **N-Type PbSe Quantum Dots via Post-Synthetic Indium Doping.** *Journal of the American Chemical Society*, *140*(42), 13753-13763. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055042438&doi=10.1021%2Fjacs.8b07910&partnerID=40&md5=14498342829736af33f2ec942679d683>

We developed a postsynthetic treatment to produce impurity n-type doped PbSe QDs with In<sup>3+</sup> as the substitutional dopant. Increasing the incorporated In content is accompanied by a gradual bleaching of the interband first-exciton transition and concurrently the appearance of a size-dependent, intraband absorption, suggesting the controlled introduction of delocalized electrons into the QD band edge states under equilibrium conditions. We compare the optical properties of our In-doped PbSe QDs to cobaltocene treated QDs, where the n-type dopant arises from remote reduction of the PbSe QDs and observe similar behavior.

Spectroelectrochemical measurements also demonstrate characteristic n-type signatures, including both an induced absorption within the electrochemical bandgap and a shift of the Fermi-level toward the conduction band. Finally, we demonstrate that the In<sup>3+</sup> dopants can be reversibly removed from the PbSe QDs, whereupon the first exciton bleach is recovered. Our results demonstrate that PbSe QDs can be controllably n-type doped via impurity aliovalent substitutional doping. © 2018 American Chemical Society.

Munárriz, J., Rabuffetti, F. A., & Contreras-García, J. (2018). **Building Fluorinated Hybrid Crystals: Understanding the Role of Noncovalent Interactions.** *Crystal Growth and Design*. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055123856&doi=10.1021%2Facs.cgd.8b01105&partnerID=40&md5=d892a3863cf9c6e01701ce8cc0980015>

Noncovalent interactions play a key role in functional materials. Metal-organofluorine interactions are of special interest because they directly affect the structure and reactivity of hybrid fluorinated materials. In-depth understanding and modulating of these interactions would enable the rational design of functional materials from fundamental chemical principles. In this work, we propose a computational approach that enables a comprehensive and quantitative characterization of noncovalent interactions (NCIs) in hybrid fluorinated crystals. Our approach couples dispersion-corrected density functional theory to NCI analysis. Additionally, we determine electron densities at bond critical points and identify electrostatic interactions using a simple electrostatic model. The versatility of this approach to probe a wide range of NCIs is demonstrated for a series of four bimetallic fluorinated crystals incorporating alkali-manganese(II) pairs and trifluoroacetato ligands. Noncovalent interactions in these hybrid crystals include metal-oxygen, metal-fluorine, hydrogen bonds, and van der Waals forces. Using K<sub>2</sub>Mn<sub>2</sub>(tfa)<sub>6</sub>(tfaH)<sub>2</sub>·H<sub>2</sub>O as an example, we demonstrate that its two-dimensional layered structure stems from a unique balance between these four NCIs. The computational approach presented herein should have general applicability to the quantitative study of NCIs in hybrid crystals, thereby serving as a guide for crystal engineering of novel hybrid materials. © 2018 American Chemical Society.

Munkanatta Godage, D. N. P., VanHecke, G. C., Samarasinghe, K. T. G., Feng, H. Z., Hiske, M., Holcomb, J., . . . Ahn, Y. H. (2018). **SMYD2 glutathionylation contributes to degradation of sarcomeric proteins.** *Nature Communications*, *9*(1). <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055079099&doi=10.1038%2Fs41467-018-06786-x&partnerID=40&md5=a36ca73b48729f9ec75476d43b4be3f1>

Reactive oxygen species (ROS) contribute to the etiology of multiple muscle-related diseases. There is emerging

evidence that cellular stress can lead to destabilization of sarcomeres, the contractile unit of muscle. However, it is incompletely understood how cellular stress induces structural destabilization of sarcomeres. Here we report that glutathionylation of SMYD2 contributes to a loss of myofibril integrity and degradation of sarcomeric proteins mediated by MMP-2 and calpain 1. We used a clickable glutathione approach in a cardiomyocyte cell line and found selective glutathionylation of SMYD2 at Cys13. Biochemical analysis demonstrated that SMYD2 upon oxidation or glutathionylation at Cys13 loses its interaction with Hsp90 and N2A, a domain of titin. Upon dissociation from SMYD2, N2A or titin is degraded by activated MMP-2, suggesting a protective role of SMYD2 in sarcomere stability. Taken together, our results support that SMYD2 glutathionylation is a novel molecular mechanism by which ROS contribute to sarcomere destabilization. © 2018, The Author(s).

**Sirinimal, H. S., Hebert, S. P., Samala, G., Chen, H., Rosenhauer, G. J., Bernhard Schlegel, H., & Stockdill, J. L. (2018). Synthetic and Computational Study of Tin-Free Reductive Tandem Cyclizations of Neutral Aminyl Radicals. *Organic Letters*, 20(20), 6340-6344.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054203693&doi=10.1021%2fac.orglett.8b02456&partnerID=40&md5=81888799dfec5f6bc8bb8683fd04ba99>

5-exo, 5-exo Cyclizations of conformationally unbiased propargylic aminyl radicals proceed with excellent yield, chemoselectivity, and diastereoselectivity under tin-free reductive cyclization conditions, regardless of the electronic environments and intermediate radical stabilization resulting from various olefin substituents. These conditions avoid the need for slow addition of initiator and reductant. By contrast, analogous 6-exo, 5-exo cyclizations require substituents capable of intermediate radical stabilization to avoid premature reduction products. These experimental results are corroborated by computations that further establish the reactivity of these aminyl radicals upon exposure to tin-free cyclization conditions. © 2018 American Chemical Society.

**Verani, C. N. (2018). Molecular rectifiers based on five-coordinate iron(iii)-containing surfactants. *Dalton Transactions*, 47(40), 14153-14168.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054892047&doi=10.1039%2fc8dt02891e&partnerID=40&md5=1d1950ab7f2015d38fefd57dec1d7864>

In this article we review the state-of-the-art of metallorganic-based molecular rectification with an emphasis on our research in five-coordinate FeIII-containing surfactants. We place rectification in the broader context of molecular electronics, and include the description of methodology used in electrode LB film electrode assemblies, concluding with an outlook on future directions for metallosurfactants. © 2018 The Royal Society of Chemistry.

**Verani, C. N., & Layfield, R. A. (2018). Molecular metal-containing soft materials. *Dalton Transactions*, 47(40), 14123-14124.** <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055071819&doi=10.1039%2fc8dt90168f&partnerID=40&md5=e2b80595ad2a7815b4f71bbd2295b928>

(no abstract available)

**Weeraratne, A. D. K. I., Baydoun, H., Shakya, R., Niklas, J., Xie, L., Mao, G., . . . Verani, C. N. (2018). Observation of current rectification by the new bimetallic iron(iii) hydrophobe [Fe III 2 (LN4O6)] on AuLB-moleculeAu devices. *Dalton Transactions*, 47(40), 14352-14361.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054890764&doi=10.1039%2fc8dt03158d&partnerID=40&md5=25e8c64627545fd77afbee2ba0b6a514>

Targeting the development of stimulus-responsive molecular materials with electronic functionality, we have synthesized and studied the redox and electronic properties of a new bimetallic iron hydrophobe [FeII<sub>2</sub>(LN4O6)] (1). The new H6LN4O6 ligand displays bicompartamental topology capable of accomodating two five-coordinate HSFeIII ions bridged by tetraaminobenzene at a close distance of ca. 8 Å. We show that the metal-based reduction processes in (1) proceed sequentially, as observed for electronically coupled metal centers. This species forms a well-defined Pockels-Langmuir film at the air-water interface, with collapse pressure of 32 mN m<sup>-1</sup>. Langmuir-Blodgett monolayers were deposited on gold substrates and used to investigate current-voltage (I-V) measurements. This unprecedented bimetallic hydrophobe [FeII<sub>2</sub>(LN4O6)] (1) shows unquestionable molecular rectification and displays a rectification ratio RR between 2 and 15. © 2018 The Royal Society of Chemistry.

**Boles, G. C., Wu, R. R., Rodgers, M. T., & Armentrout, P. B. (2018). Protonated Asparaginy-Alanine Decomposition: a TCID, SORI-CID, and Computational Analysis. *Journal of the American Society for Mass Spectrometry*, 29(12), 2341-2359.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056856768&doi=10.1007%2fs13361-018-2052-5&partnerID=40&md5=481fedef8d87ff5ed6666f5302adf4d4>

Deamidation of asparagine residues, one of the fastest known post-translational modifications in proteins, plays a significant role in various biological functions and degenerative, aging diseases. Here, we present a full description of deamidation (as well as other key dissociation processes) from protonated asparaginy-alanine, H<sup>+</sup>(AsnAla), by studying its kinetic energy-dependent threshold collision-induced dissociation (TCID) with Xe using a guided ion beam tandem mass spectrometer. Relative thresholds compare favorably with those acquired by sustained off-resonance irradiation-CID of H<sup>+</sup>(AsnAla) with Ar in a Fourier transform ion cyclotron resonance mass spectrometer. Absolute threshold energies from the TCID studies are compared to relative single point energies of major reaction species calculated at the B3LYP, B3LYP-GD3BJ, B3P86, MP2(full), and M06-2X levels of theory. Relative energies of key TSs and products allow for the characterization of the important rate-limiting steps involved in H<sup>+</sup>(AsnAla) decomposition. The influence of water solvation on key TSs is also explored computationally, where bridging the gap between gas-phase and solvated studies is an important aspect of the biological relevance of this analysis. The comprehensive results presented (in addition to complementary studies discussed herein) allow for an insightful comparison to previous deamidation studies such that effects of the C-terminal residue side chain can be elucidated. [Figure not available: see fulltext.]. © 2018, American Society for Mass Spectrometry.

**Garre, S., Gamage, A. K., Faner, T. R., Dedigama-Arachchige, P., & Pflum, M. K. H. (2018). Identification of Kinases and Interactors of p53 Using Kinase-Catalyzed Cross-Linking and Immunoprecipitation. *Journal of the American Chemical Society*, 140(47), 16299-16310.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056728463&doi=10.1021%2fjacs.8b10160&partnerID=40&md5=964e3ef987ea1f4c448a3ebe3821070f>

Kinase enzymes phosphorylate protein substrates in a highly ordered manner to control cell signaling. Unregulated kinase activity is associated with a variety of disease states, most notably cancer, making the characterization of kinase activity in cells critical to understand disease formation. However, the paucity of available tools has prevented a full mapping of the substrates and interacting proteins of kinases involved in cellular function. Recently we developed kinase-catalyzed cross-linking to covalently connect substrate and kinase in a phosphorylation-dependent manner. Here, we report a new method combining kinase-catalyzed cross-linking and immunoprecipitation (K-CLIP) to identify kinase-substrate pairs and kinase-associated proteins. K-CLIP was applied to the substrate p53, which is robustly phosphorylated. Both known and unknown kinases of

p53 were isolated from cell lysates using K-CLIP. In follow-up validation studies, MRCKbeta was identified as a new p53 kinase. Beyond kinases, a variety of p53 and kinase-associated proteins were also identified using K-CLIP, which provided a snapshot of cellular interactions. The K-CLIP method represents an immediately useful chemical tool to identify kinase-substrate pairs and multiprotein complexes in cells, which will embolden cell signaling research and enhance our understanding of kinase activity in normal and disease states. Copyright © 2018 American Chemical Society.

**Hollingsworth, R. L., Beattie, J. W., Grass, A., Martin, P. D., Groysman, S., & Lord, R. L. (2018). Reactions of dicobalt octacarbonyl with dinucleating and mononucleating bis(imino)pyridine ligands. *Dalton Transactions*, 47(43), 15353-15363. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056119102&doi=10.1039%2fC8DT03405B&partnerID=40&md5=f67767ae8e2687a62151718cd6f39b92>**

This work focuses on the application of dicobalt octacarbonyl ( $\text{Co}_2(\text{CO})_8$ ) as a metal precursor in the chemistry of formally low-valent cobalt with redox-active bis(imino)pyridine [NNN] ligands. The reactions of both mononucleating mesityl-substituted bis(aldimino)pyridine (L1) and dinucleating macrocyclic xanthene-bridged di(bis(aldimino)pyridine) (L2) with  $\text{Co}_2(\text{CO})_8$  were investigated. Independent of the metal-to-ligand ratio (1 : 1 or 1 : 2 ligand to  $\text{Co}_2(\text{CO})_8$ ), the reaction of the dinucleating ligand L2 with  $\text{Co}_2(\text{CO})_8$  produces a tetranuclear complex  $[\text{Co}_4(\text{L}_2)(\text{CO})_{10}]$  featuring two discrete  $[\text{Co}_2(\text{NNN})(\text{CO})_5]$  units. In contrast, a related mononucleating bis(aldimino)pyridine ligand, L1, produces different species at different ligand to  $\text{Co}_2(\text{CO})_8$  ratios, including dinuclear  $[\text{Co}_2(\text{CO})_5(\text{L}_1)]$  and zwitterionic  $[\text{Co}(\text{L}_1)_2][\text{Co}(\text{CO})_4]$ . Interestingly,  $[\text{Co}_4(\text{L}_2)(\text{CO})_{10}]$  features metal-metal bonds, and no bridging carbonyls, whereas  $[\text{Co}_2(\text{CO})_5(\text{L}_1)]$  contains cobalt centers bridged by one or two carbonyl ligands. In either case, treatment with excess acetonitrile leads to disproportionation to the zwitterionic  $[\text{Co}(\text{NNN})(\text{NCMe})_2][\text{Co}(\text{CO})_4]$  units. The electronic structures of the complexes described above were studied with density functional theory. All the obtained bis(imino)pyridine complexes serve as catalysts for cyclotrimerization of methyl propiolate, albeit their reactivity is inferior compared with  $\text{Co}_2(\text{CO})_8$ . © The Royal Society of Chemistry.

**Li, F., Chernyak, V. Y., & Sinitsyn, N. A. (2018). Quantum Annealing and Thermalization: Insights from Integrability. *Physical Review Letters*, 121(19). <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056591575&doi=10.1103%2fPhysRevLett.121.190601&partnerID=40&md5=a6f8658b72feca4f6666e6a1818bfe17>**

We solve a model that has basic features that are desired for quantum annealing computations: entanglement in the ground state, controllable annealing speed, ground state energy separated by a gap during the whole evolution, and a programmable computational problem that is encoded by parameters of the Ising part of the spin Hamiltonian. Our solution enables exact nonperturbative characterization of final nonadiabatic excitations, including a scaling of their number with the annealing rate and the system size. We prove that quantum correlations can accelerate computations and, at the end of the annealing protocol, lead to the perfect Gibbs distribution of all microstates. © 2018 American Physical Society.

**Yee, T. A., Suescun, L., & Rabuffetti, F. A. (2019). Bond valence parameters for alkali- and alkaline-earth-oxygen pairs: derivation and application to metal-organic compounds. *Journal of Solid State Chemistry*, 270, 242-246. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057213602&doi=10.1016%2fj.jssc.2018.11.025&partnerID=40&md5=04b4720695d794833c0792026c8bf9a0>**

New bond valence  $R_0$  parameters were derived for alkali- and alkaline-earth-oxygen pairs encountered in

metal-organic compounds. A total of 7693 metal-oxygen bond lengths were extracted from structures deposited in the Cambridge Structural Database (CSD) and containing at least one carboxylate ligand bound to the metal. One hundred structures were individually analyzed for each metal. R0 values were computed using two different approaches: geometric mean and graphical fitting. In both cases, the bond valence parameter  $b$  was fixed at 0.37 Å. R0 values obtained using a geometric mean approach were 1.744 (Na-O), 2.094 (K-O), 2.228 (Rb-O), 2.412 (Cs-O), 1.661 (Mg-O), 1.933 (Ca-O), 2.090 (Sr-O), and 2.265 Å (Ba-O). These parameters yielded more accurate metal bond valence sums (BVS) and lower root-mean square deviations (RMSD) than those computed using R0 values currently available in the literature,<sup>1</sup> which had been derived from the structures of inorganic oxides. The most significant improvement was observed for sodium (this work mean BVS = 1.01 v.u., RMSD = 0.116 v.u.; literature mean BVS = 1.18 v.u., RMSD = 0.226 v.u.; v.u.: valence units) and magnesium (this work mean BVS = 2.00 v.u., RMSD = 0.038 v.u.; literature mean BVS = 2.18 v.u., RMSD = 0.100 v.u.). More accurate bond valence sums and lower variances were also observed when the new set of R0 values was applied to metal-organic compounds featuring oxygenated ligands such as ethers, ketones, aldehydes, alcohols, and esters. These parameters should be applicable to the structural and crystal-chemical analysis of metal-organic compounds ranging from coordination complexes to organic-inorganic extended hybrids. © 2018 Elsevier Inc.

## CLASSICAL & MODERN LANGUAGES, LITERATURES AND CULTURES

**Casielles-Suárez, E. (2018). Gender assignment to Spanish-English mixed DPs Singleton vs. multiword switches. *Spanish in Context*, 15(3), 392-416.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057424033&doi=10.1075%2fsic.00020.cas&partnerID=40&md5=101b6233108241480c2051e61161b9de>

Previous studies on gender assignment to Spanish-English mixed Determiner Phrases (DPs) have noticed a tendency to default to the masculine gender (e.g. el store). However, some studies have revealed that other factors such as the gender of the Spanish translation equivalent (analogical criterion) are also relevant, particularly in written discourse (e.g. la conference). Further, it has been hypothesized that feminine-marked mixed DPs in oral discourse, which are viewed as exceptions to the default gender strategy, should be highly restricted to singleton switches (Valdés Kroff 2016). This paper investigates if feminine-marked mixed DPs are restricted to singleton switches in written discourse by analyzing a mixed-language text, which contains both types of switches (singleton and multiword). The results confirm the importance of the analogical criterion in written discourse and show that feminine-marked DPs are not restricted to singleton switches, and that the analogical criterion is relevant to both singleton and multiword switches. © John Benjamins Publishing Company.

## CRIMINAL JUSTICE

**Kelsay, J. D., Papp, J., Wareham, J., & Smith, B. W. (2018). In Guns We Trust: A Reexamination of the Collective Security Hypothesis. *Criminal Justice and Behavior*, (article in press).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053353645&doi=10.1177%2f0093854818793688&partnerID=40&md5=50bf9bd441faded93637a54cd3d011e2>

This study reexamines the collective security hypothesis of gun ownership using data collected from residents of the city of Detroit, Michigan. In addition, we seek to determine whether the effects of perceptions of police, fear of crime, and victimization on individual-level gun ownership are attenuated by neighborhood levels of informal

social control. Our findings indicate that police satisfaction remains a robust predictor of gun ownership, in that those who are less satisfied with police are more likely to own a firearm for defensive purposes. Moreover, the effects of this variable remain unaffected by the inclusion of informal social control. These results confirm a number of previously identified correlates of gun ownership remain influential and suggest that improving perceptions of police among the public may lead to fewer firearms in circulation among the public. © 2018 International Association for Correctional and Forensic Psychology.

**Larson, M., Xu, Y., Ouellet, L., & Klahm, C. F. I. (2019). Exploring the impact of 9398 demolitions on neighborhood-level crime in Detroit, Michigan. *Journal of Criminal Justice*, 60, 57-63.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057299919&doi=10.1016%2fj.jcrimjus.2018.11.002&partnerID=40&md5=a9339b9638bcc9b6ee0f1d6b06b5a0ee>

The intersection of neighborhood-level processes and crime has received a wealth of attention in the criminological literature over the last century. In line with this tradition, the current study focuses its attention to one of the more recent, and woefully under-explored, policy phenomena embraced by a growing number of cities throughout the United States: demolitions. From 2010 to 2014, the city of Detroit successfully completed a total of 9398 demolitions, making it the nation's leader in the demolitions experiment. Focusing specifically on crime at the block-group level, we examine the association between demolitions and changes in four crime types (i.e. total crime, violent crime, drug crime, and property crime) by calling upon a set of publicly available geo-spatial crime and demolition data. We find that demolitions have a statistically and substantively meaningful negative relationship with total crime, violent crime, and property crime in 2014, net of controls for prior crime and structural covariates. Supplemental analyses also indicate that reductions in crime from 2009 to 2014 were greatest among block-groups that experienced the greatest number of demolitions. We conclude with a discussion of the theoretical and policy implications of demolitions as a potentially valuable crime reduction strategy. © 2018 Elsevier Ltd

## ECONOMICS

**King, A. M., Danagouliau, S., Lynch, M., Menke, N., Mu, Y., Saul, M., . . . Pizon, A. F. (2018). The Effect of a Medical Toxicology Inpatient Service in an Academic Tertiary Care Referral Center. *Journal of Medical Toxicology*. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055719173&doi=10.1007%2fs13181-018-0684-2&partnerID=40&md5=693631d2213a2860f0fd999b30c779bd>**

Introduction: Morbidity and mortality from poison- and drug-related illness continue to rise in the USA. Medical toxicologists are specifically trained to diagnose and manage these patients. Inpatient medical toxicology services exist but their value-based economic benefits are not well established. Methods: This was a retrospective study where length of stay (LOS) and payments received between a hospital with an inpatient medical toxicology service (TOX) and a similar hospital in close geographic proximity that does not have an inpatient toxicology service (NONTOX) were compared. Controlling for zip code, demographics and distance patients lived from each hospital, we used a fitted multivariate linear regression model to identify factors associated with changes in LOS and payment. Results: Patients admitted to the TOX center had 0.87 days shorter LOS per encounter and the hospital received an average of \$1800 more per patient encounter. Conclusion: In this study, the presence of an inpatient medical toxicology service was associated with decreased patient LOS and increased reimbursement for admitted patients. Differences may be attributable to improved direct patient care provided by medical toxicologists, but future prospective studies are needed. © 2018, American



College of Medical Toxicology.

**Braid, R. M. (2018). Partial peak-load pricing of a transportation bottleneck with homogeneous and heterogeneous values of time. *Economics of Transportation*, 16, 29-41.**

[http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057181389&doi=10.1016%2fj.ecotra.2018.08.001&partnerID=40&md5=750a6574d298845b3cf6d303fd6d6da\\_b](http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057181389&doi=10.1016%2fj.ecotra.2018.08.001&partnerID=40&md5=750a6574d298845b3cf6d303fd6d6da_b)

The first-best solution for a transportation bottleneck is to impose a first-best peak-load toll that varies continuously over time, reaching its maximum value at the most desirable crossing time. This eliminates all wasteful queueing. With homogeneous values of time, the private costs of consumers are unchanged, but the large maximum value of the first-best toll may make it politically infeasible. In this paper, I consider continuously time-varying partial peak-load tolls that have a much lower maximum value, but which still achieve a large fraction of the efficiency gain of the first-best toll. With heterogeneous values of time, a partial peak-load toll can leave all consumers with unchanged or decreased private costs even when the first-best toll does not do this. © 2018 Elsevier Ltd

## ENGLISH

**Goodrich, J. (2018). Suspicious Moderate: The Life and Writings of Francis a Sancta Clara (1598-1680). *Renaissance Quarterly*, 71(3), 1150-1151.**

<http://proxy.lib.wayne.edu/login?url=https://www.journals.uchicago.edu/doi/full/10.1086/700501>

(no abstract available)

**Scrivener, M. (2018). Print, Publicity and Radicalism in the 1790s: The Laurel of Liberty. *Studies in Romanticism*, 57(2), 332-336.**

<http://proxy.lib.wayne.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ofs&AN=131652146&site=ehost-live&scope=site>

(no abstract available)

**Pruchnic, J. (2017). The priority of form: Kenneth burke and the rediscovery of affect and rhetoric. In *The Palgrave Handbook of Affect Studies and Textual Criticism* (pp. 371-390).**

[http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055372001&doi=10.1007%2f978-3-319-63303-9\\_14&partnerID=40&md5=41dba409e7d3002b271c87fbd257bcd](http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055372001&doi=10.1007%2f978-3-319-63303-9_14&partnerID=40&md5=41dba409e7d3002b271c87fbd257bcd)

This essay analyzes the treatment of affect and aesthetic form in the major mid-century works of the prominent literary and rhetorical theorist Kenneth Burke. In engaging Burke's prescient studies of the intersection of human physiological response with culture and art, this essay demonstrates how Burke's work remains particularly relevant to the present, a time wherein the dominant texts and media seem more than ever to be dependent on structures of feeling and persuasion mapped by Burke decades ago. © 2018 Springer Nature Switzerland AG.

Schmidt, M. D. (2018). A Materialist Desire in The Young and Evil. *Studies in American Fiction*, 45(2), 213-233. <http://proxy.lib.wayne.edu/login?url=https://doi.org/10.1353/saf.2018.0010>

(no abstract available)

## HISTORY

Lynch, W. T. (2018). The challenge to consensus: The relevance of the Lakatos-Feyerabend debate for contemporary science and technology studies. *Epistemology and Philosophy of Science*, 55(3), 57-61.

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056701370&doi=10.5840%2feps201855348&partnerID=40&md5=e5543f5e5ae389711a103c983a353ed4>

Responding to comments on “Imre Lakatos and the Inexhaustible tom: The Hidden Marxist Roots of History and Philosophy of Science,” an argument is made for reviving a missed opportunity for integrating sociological and normative approaches to science. Lakatos' mature philosophy of science, though jettisoning a political commitment to Marxism, retains a dialectical approach developed during his Hungarian career. Through his carefully crafted debate with Feyerabend, Lakatos continued to promote a dialectical approach that offers a useful model for integrating the history of science and normative assessments focused on the viability of approaches that challenge dominant perspectives. © 2018 RAS Institute of Philosophy. All rights reserved.

## MATHEMATICS

Angelini-Knoll, G., & Salch, A. (2018). A may-type spectral sequence for higher topological hochschild homology. *Algebraic and Geometric Topology*, 18(5), 2593-2660.

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052631732&doi=10.2140%2fagt.2018.18.2593&partnerID=40&md5=d81a6f28ba8ff1c93b886745d254be61>

Given a filtration of a commutative monoid  $A$  in a symmetric monoidal stable model category  $C$ , we construct a spectral sequence analogous to the May spectral sequence whose input is the higher order topological Hochschild homology of the associated graded commutative monoid of  $A$ , and whose output is the higher order topological Hochschild homology of  $A$ . We then construct examples of such filtrations and derive some consequences: for example, given a connective commutative graded ring  $R$ , we get an upper bound on the size of the THH-groups of  $E_\infty$ -ring spectra  $A$  such that  $\pi^*(A) \cong R$ . © 2018, Mathematical Sciences Publishers. All rights reserved.

Gupta, R., Jafari, F., Kipka, R. J., & Mordukhovich, B. S. (2018). Linear openness and feedback stabilization of nonlinear control systems. *Discrete and Continuous Dynamical Systems - Series S*, 11(6), 1103-1119.

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053628851&doi=10.3934%2fdcdss.2018063&partnerID=40&md5=313785a9e063d9bbd2ca7c86ece35758>

It is well known from the seminal Brockett's theorem that the openness property of the mapping on the right-hand side of a given nonlinear ODE control system is a necessary condition for the existence of locally asymptotically stabilizing continuous stationary feedback laws. However, this condition fails to be sufficient for

such a feedback stabilization. In this paper we develop an approach of variational analysis to continuous feedback stabilization of nonlinear control systems with replacing openness by the linear openness property, which has been well understood and characterized in variational theory. It allows us, in particular, to obtain efficient conditions via the system data supporting the sufficiency in Brockett's theorem and ensuring local exponential stabilization by means of continuous stationary feedback laws. Furthermore, we derive new necessary conditions for local exponential and asymptotic stabilization of continuous-time control systems by using both continuous and continuously differentiable stationary feedback laws and establish also some counterparts of the obtained sufficient conditions for local asymptotic stabilization by continuous stationary feedback laws in the case of nonlinear discrete-time control systems. © 2018 American Institute of Mathematical Sciences. All rights reserved.

**Hoang, N. D., & Mordukhovich, B. S. (2018). Extended Euler–Lagrange and Hamiltonian Conditions in Optimal Control of Sweeping Processes with Controlled Moving Sets. Journal of Optimization Theory and Applications, (article in press). <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053245801&doi=10.1007%2fs10957-018-1384-4&partnerID=40&md5=ba194f2fb802923924756e14fafbbe0b>**

This paper concerns optimal control problems for a class of sweeping processes governed by discontinuous unbounded differential inclusions that are described via normal cone mappings to controlled moving sets. Largely motivated by applications to hysteresis, we consider a general setting where moving sets are given as inverse images of closed subsets of finite-dimensional spaces under nonlinear differentiable mappings dependent on both state and control variables. Developing the method of discrete approximations and employing generalized differential tools of first-order and second-order variational analysis allow us to derive nondegenerate necessary optimality conditions for such problems in extended Euler–Lagrange and Hamiltonian forms involving the Hamiltonian maximization. The latter conditions of the Pontryagin Maximum Principle type are the first in the literature for optimal control of sweeping processes with control-dependent moving sets. © 2018, Springer Science+Business Media, LLC, part of Springer Nature.

**Klein, J. R., & Malkiewich, C. (2018). The transfer is functorial. Advances in Mathematics, 338, 1119-1140. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053723125&doi=10.1016%2fj.aim.2018.09.017&partnerID=40&md5=28ccb87dfdb5eb1457f59ec7f75c12a0>**

We prove that the Becker–Gottlieb transfer is functorial up to homotopy, for all fibrations with finitely dominated fibers. This resolves a lingering foundational question about the transfer, which was originally defined in the late 1970s in order to simplify the proof of the Adams conjecture. Our approach differs from previous attempts in that we closely emulate the geometric argument in the case of a smooth fiber bundle. This leads to a “multiplicative” description of the transfer, different from the standard presentation as the trace of a diagonal map. © 2018 Elsevier Inc.

**Kumar, R., & Popovic, L. (2018). Corrigendum to “Large deviations for multi-scale jump-diffusion processes” [Stochastic Process. Appl. 127 (2017) 1297–1320]. Stochastic Processes and their Applications, (article in press). <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054016742&doi=10.1016%2fj.spa.2018.08.015&partnerID=40&md5=abb5a36edfa09ecfe4d17bcc811c9ad9>**

**Menaldi, J. L., & Robin, M. (2017).** On some impulse control problems with constraint. *SIAM Journal on Control and Optimization*, 55(5), 3204-3225.

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053563910&doi=10.1137%2f16M1090302&partnerID=40&md5=4a49df66dcda1ebb8bf48b39d10f6bc5>

The impulse control of a Markov-Feller process is considered when the impulses are allowed only when a signal arrives. This is referred to as an impulse control problem with constraint. A detailed setting is described, a characterization of the optimal cost is obtained using previous results of the authors on optimal stopping problems with constraint, and an optimal impulse control is identified. © 2017 Society for Industrial and Applied Mathematics Publications. All rights reserved.

**Menaldi, J. L., & Robin, M. (2018).** On some ergodic impulse control problems with constraint. *SIAM Journal on Control and Optimization*, 56(4), 2690-2711.

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053502054&doi=10.1137%2f17M1147573&partnerID=40&md5=11749a57d2d15b84f4288c522f175f5f>

This paper studies the impulse control of a general Markov process under the average (or ergodic) cost when the impulse instants are restricted to be the arrival times of an exogenous process, and this restriction is referred to as a constraint. A detailed setting is described, a characterization of the optimal cost is obtained as a solution of an HJB equation, and an optimal impulse control is identified. © 2018 Society for Industrial and Applied Mathematics.

**Dempe, S., Mordukhovich, B. S., & Zemkoho, A. B. (2018).** Two-level value function approach to non-smooth optimistic and pessimistic bilevel programs. *Optimization*.

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057295751&doi=10.1080%2f02331934.2018.1543294&partnerID=40&md5=186b4d97851effc8595b087c95725d5c>

The authors' paper in Dempe et al. [Necessary optimality conditions in pessimistic bilevel programming. *Optimization*. 2014;63:505–533], was the first one to provide detailed optimality conditions for pessimistic bilevel optimization. The results there were based on the concept of the two-level optimal value function introduced and analysed in Dempe et al. [Sensitivity analysis for two-level value functions with applications to bilevel programming. *SIAM J. Optim.* 22 (2012), 1309–1343], for the case of optimistic bilevel programs. One of the basic assumptions in both of these papers is that the functions involved in the problems are at least continuously differentiable. Motivated by the fact that many real-world applications of optimization involve functions that are non-differentiable at some points of their domain, the main goal of the current paper is to extend the two-level value function approach by deriving new necessary optimality conditions for both optimistic and pessimistic versions in bilevel programming with non-smooth data. © 2018, © 2018 Informa UK Limited, trading as Taylor & Francis Group.

**Gheorghe, B., Isaksen, D. C., & Ricka, N. (2018).** The Picard group of motivic  $AC(1)$ . *Journal of Homotopy and Related Structures*, 13(4), 847-865.

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056142801&doi=10.1007%2fs40062-018-0200-z&partnerID=40&md5=120a32a8e52a1be4b9e8477453b5e85d>

We show that the Picard group  $\text{Pic}(AC(1))$  of the stable category of modules over C-motivic  $AC(1)$  is isomorphic to  $\mathbb{Z}^2$ . By comparison, the Picard group of classical  $A(1)$  is  $\mathbb{Z} \oplus \mathbb{Z}/2$ . One extra copy of  $\mathbb{Z}$  arises from the motivic bigrading. The joker is a well-known exotic element of order 2 in the Picard group of classical  $A(1)$ . The C-motivic joker has infinite order. © 2018, Tbilisi Centre for Mathematical Sciences.

**Hang, N. T. V., Mordukhovich, B. S., & Sarabi, M. E. (2018). Second-order variational analysis in second-order cone programming. *Mathematical Programming*.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055983110&doi=10.1007%2fs10107-018-1345-6&partnerID=40&md5=74c534ec9d070576479001ef539ab627>

The paper conducts a second-order variational analysis for an important class of nonpolyhedral conic programs generated by the so-called second-order/Lorentz/ice-cream cone  $Q$ . From one hand, we prove that the indicator function of  $Q$  is always twice epi-differentiable and apply this result to characterizing the uniqueness of Lagrange multipliers together with an error bound estimate in the general second-order cone programming setting involving twice differentiable data. On the other hand, we precisely calculate the graphical derivative of the normal cone mapping to  $Q$  under the metric subregularity constraint qualification and then give an application of the latter result to a complete characterization of isolated calmness for perturbed variational systems associated with second-order cone programs. The obtained results seem to be the first in the literature in these directions for nonpolyhedral problems without imposing any nondegeneracy assumptions. © 2018, Springer-Verlag GmbH Germany, part of Springer Nature and Mathematical Optimization Society.

**Hu, P., Kriz, I., & Somberg, P. (2019). Derived representation theory of Lie algebras and stable homotopy categorification of  $\text{slk}$ . *Advances in Mathematics*, 341, 367-439.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056165996&doi=10.1016%2fj.aim.2018.10.044&partnerID=40&md5=ad3be21da834bb782514e63162f67282>

We set up foundations of representation theory over  $S$ , the sphere spectrum, which is the “initial ring” of stable homotopy theory. In particular, we treat  $S$ -Lie algebras and their representations, characters,  $\text{gl}(S)$ -Verma modules and their duals, Harish-Chandra pairs and Zuckermann functors. As an application, we construct a Khovanov  $\text{slk}$ -stable homotopy type with a large prime hypothesis, which is a new link invariant, using a stable homotopy analogue of the method of J. Sussan. © 2018 Elsevier Inc.

## NUTRITION & FOOD SCIENCE

**Khor, B. H., Narayanan, S. S., Chinna, K., Gafor, A. H. A., Daud, Z. A. M., Khosla, P., . . . Karupaiah, T. (2018). Blood fatty acid status and clinical outcomes in dialysis patients: A systematic review. *Nutrients*, 10(10).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053824375&doi=10.3390%2fnu10101353&partnerID=40&md5=a3f0fa0f9835bd3066b3f4d668e14107>

Blood fatty acids (FAs) are derived from endogenous and dietary routes. Metabolic abnormalities from kidney dysfunction, as well as cross-cultural dietary habits, may alter the FA profile of dialysis patients (DP), leading to detrimental clinical outcomes. Therefore, we aimed to (i) summarize FA status of DP from different countries, (ii) compare blood FA composition between healthy controls and DP, and (iii) evaluate FA profile and clinical endpoints in DP. Fifty-three articles from 1980 onwards, reporting FA profile in hemodialysis and peritoneal DP, were identified from PubMed, Embase, and the Cochrane library. Studies on pediatric, predialysis chronic kidney

disease, acute kidney injury, and transplant patients were excluded. Moderate to high levels of n-3 polyunsaturated fatty acids (PUFA) were reported in Japan, Korea, Denmark, and Sweden. Compared to healthy adults, DP had lower proportions of n-3 and n-6 PUFA, but higher proportion of monounsaturated fatty acids. Two studies reported inverse associations between n-3 PUFAs and risks of sudden cardiac death, while one reported eicosapentaenoic acid + docosahexaenoic acid/arachidonic acid ratio was inversely associated with cardiovascular events. The relationship between all-cause mortality and blood FA composition in DP remained inconclusive. The current evidence highlights a critical role for essential FA in nutritional management of DP. © 2018 by the authors. Licensee MDPI, Basel, Switzerland.

**Saadat, N., Akhtar, S., Goja, A., Razalli, N. H., Geamanu, A., David, D., . . . Gupta, S. V. (2018). Dietary Garcinol Arrests Pancreatic Cancer in p53 and K-ras Conditional Mutant Mouse Model. *Nutrition and Cancer*.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054415580&doi=10.1080%2f01635581.2018.1502327&partnerID=40&md5=06255e841e72ca0f0a999942ac1beb3d>

Pancreatic cancer (PC) patients have poor prognosis and survival rate. Gemcitabine, the drug of choice has a dismal 15% response rate. Earlier, we reported that Garcinol alone and in combination with gemcitabine showed a dose-dependent favorable response on PC cell lines. This study probes the in vivo effects of dietary Garcinol on PC progression in transgenic PC mice (KPC; K-ras and p53 conditional mutant). KPC male mice were divided into: KC- Control diet; KGr-0.05% Garcinol diet; KGm-Gemcitabine injected; KGG–Garcinol diet + Gemcitabine injected groups. Changes in tumor progression, toxicity, or cell morphology were monitored by magnetic resonance imaging, Fore-stomach, and blood smear, respectively. Pancreatic Intraepithelial Neoplasia (mPanIN) grading with hematoxylin and eosin (H&E) staining was conducted on pancreas and validated by immunohistochemistry. The KGr group showed improved survival, no observable toxicity with marked reduction in papilloma formation in the fore-stomach, and a higher ratio of NK and NKT cells compared to Non-NK lymphocytes. Additionally, the KGr, KGm, and KGG groups showed reduction in tumor volumes and reduced number of advanced mouse PanIN3. Dietary Garcinol alone and in combination with gemcitabine retarded the progression of PC in transgenic PC mice, arresting the cancer in the earlier stages, improving prognosis and survival. © 2018, © 2018 Taylor & Francis Group, LLC.

## PHILOSOPHY

**Russell, B. (2018). THE PROBLEM OF EVIL AND REPLIES TO SOME IMPORTANT RESPONSES. *European Journal for Philosophy of Religion*, 10(3), 105-131. <https://philpapers.org/rec/RUSTPO-86>**

I begin by distinguishing four different versions of the argument from evil that start from four different moral premises that in various ways link the existence of God to the absence of suffering. The version of the argument from evil that I defend starts from the premise that if God exists, he would not allow excessive, unnecessary suffering. The argument continues by denying the consequent of this conditional to conclude that God does not exist. I defend the argument against Skeptical Theists who say we are in no position to judge that there is excessive, unnecessary suffering by arguing that this defense has absurd consequences. It allows Young Earthers to construct a parallel argument that concludes that we are in no position to judge that God did not create the earth recently. In the last section I consider whether theists can turn the argument from evil on its head by arguing that God exists. I first criticize Alvin Plantinga's theory of warrant that one might try to use to argue for God's existence. I then criticize Richard Swinburne's Bayesian argument to the same conclusion. I conclude that my version of the argument from evil is a strong argument against the existence of God and that several

important responses to it do not defeat it.

## PHYSICS & ASTRONOMY

**Alice Collaboration. (2018). Anisotropic flow of identified particles in Pb-Pb collisions at  $\sqrt{s_{NN}}=5.02$  TeV.**

**Journal of High Energy Physics, 2018(9).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052957295&doi=10.1007%2fJHEP09%282018%29006&partnerID=40&md5=a3b8889da2a604337dc614d988e68452>

The elliptic ( $v_2$ ), triangular ( $v_3$ ), and quadrangular ( $v_4$ ) flow coefficients of  $\pi^\pm$ ,  $K^\pm$ ,  $p+p^-$ ,  $\Lambda+\Lambda^-$ ,  $K_S^0$ , and the  $\phi$ -meson are measured in Pb-Pb collisions at  $\sqrt{s_{NN}}=5.02$  TeV. Results obtained with the scalar product method are reported for the rapidity range  $|y| \leq 0.5$  as a function of transverse momentum,  $p_T$ , at different collision centrality intervals between 0–70%, including ultra-central (0–1%) collisions for  $\pi^\pm$ ,  $K^\pm$ , and  $p+p^-$ . For  $p_T \leq 3$  GeV/c, the flow coefficients exhibit a particle mass dependence. At intermediate transverse momenta ( $3 \leq p_T \leq 8$ –10 GeV/c), particles show an approximate grouping according to their type (i.e., mesons and baryons). The  $\phi$ -meson  $v_2$ , which tests both particle mass dependence and type scaling, follows  $p+p^- v_2$  at low  $p_T$  and  $\pi^\pm v_2$  at intermediate  $p_T$ . The evolution of the shape of  $v_n(p_T)$  as a function of centrality and harmonic number  $n$  is studied for the various particle species. Flow coefficients of  $\pi^\pm$ ,  $K^\pm$ , and  $p+p^-$  for  $p_T \leq 3$  GeV/c are compared to iEBE-VISHNU and MUSIC hydrodynamical calculations coupled to a hadronic cascade model (UrQMD). The iEBE-VISHNU calculations describe the results fairly well for  $p_T \leq 2.5$  GeV/c, while MUSIC calculations reproduce the measurements for  $p_T \leq 1$  GeV/c. A comparison to  $v_n$  coefficients measured in Pb-Pb collisions at  $\sqrt{s_{NN}}=2.76$  TeV is also provided. [Figure not available: see fulltext.]. © 2018, The Author(s).

**Alice Collaboration. (2018). Azimuthally-differential pion femtoscopy relative to the third harmonic event plane in Pb–Pb collisions at  $\sqrt{s_{NN}}=2.76$  TeV. Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics, 785, 320-331.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053804355&doi=10.1016%2fj.physletb.2018.06.042&partnerID=40&md5=01bcd847a5df7e05e09e4b22b6d1d934>

Azimuthally-differential femtoscopic measurements, being sensitive to spatio-temporal characteristics of the source as well as to the collective velocity fields at freeze out, provide very important information on the nature and dynamics of the system evolution. While the HBT radii oscillations relative to the second harmonic event plane measured recently reflect mostly the spatial geometry of the source, model studies have shown that the HBT radii oscillations relative to the third harmonic event plane are predominantly defined by the velocity fields. In this Letter, we present the first results on azimuthally-differential pion femtoscopy relative to the third harmonic event plane as a function of the pion pair transverse momentum  $k_T$  for different collision centralities in Pb–Pb collisions at  $\sqrt{s_{NN}}=2.76$  TeV. We find that the  $R_{side}$  and  $R_{out}$  radii, which characterize the pion source size in the directions perpendicular and parallel to the pion transverse momentum, oscillate in phase relative to the third harmonic event plane, similar to the results from 3+1D hydrodynamical calculations. The observed radii oscillations unambiguously signal a collective expansion and anisotropy in the velocity fields. A comparison of

the measured radii oscillations with the Blast-Wave model calculations indicate that the initial state triangularity is washed-out at freeze out. © 2018 European Organization for Nuclear Research

**Alice Collaboration. (2018). Dielectron production in proton-proton collisions at  $\sqrt{s}=7$  TeV. Journal of High Energy Physics, 2018(9).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053272489&doi=10.1007%2fJHEP09%282018%29064&partnerID=40&md5=932d778abf69a77abbfc13fe16ca d88>

The first measurement of  $e^+e^-$  pair production at mid-rapidity ( $|\eta| \leq 0.8$ ) in pp collisions at  $\sqrt{s}=7$  TeV with ALICE at the LHC is presented. The dielectron production is studied as a function of the invariant mass ( $m_{ee} \leq 3.3$  GeV/c<sup>2</sup>), the pair transverse momentum ( $p_{T,ee} \leq 8$  GeV/c), and the pair transverse impact parameter (DCA<sub>ee</sub>), i.e., the average distance of closest approach of the reconstructed electron and positron tracks to the collision vertex, normalised to its resolution. The results are compared with the expectations from a cocktail of known hadronic sources and are well described when PYTHIA is used to generate the heavy-flavour contributions. In the low-mass region ( $0.14 \leq m_{ee} \leq 1.1$  GeV/c<sup>2</sup>), prompt and non-prompt  $e^+e^-$  sources can be separated via the DCA<sub>ee</sub>. In the intermediate-mass region ( $1.1 \leq m_{ee} \leq 2.7$  GeV/c<sup>2</sup>), a double-differential fit to the data in  $m_{ee}$  and  $p_{T,ee}$  and a fit of the DCA<sub>ee</sub> distribution allow the total  $c\bar{c}$  and  $b\bar{b}$  cross sections to be extracted. Two different event generators, PYTHIA and POWHEG, can reproduce the shape of the two-dimensional  $m_{ee}$  and  $p_{T,ee}$  spectra, as well as the shape of the DCA<sub>ee</sub> distribution, reasonably well. However, differences in the  $c\bar{c}$  and  $b\bar{b}$  cross sections are observed when using the generators to extrapolate to full phase space. Finally, the ratio of inclusive to decay photons is studied via the measurement of virtual direct photons in the transverse-momentum range  $1 \leq p_T \leq 8$  GeV/c. This is found to be unity within the statistical and systematic uncertainties and consistent with expectations from next-to-leading order perturbative quantum chromodynamic calculations.[Figure not available: see fulltext.]. © 2018, The Author(s).

**Alice Collaboration. (2018). Inclusive  $J/\psi$  production in Xe–Xe collisions at  $\sqrt{s_{NN}}=5.44$  TeV. Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics, 785, 419-428.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053220416&doi=10.1016%2fj.physletb.2018.08.047&partnerID=40&md5=de4e88f15d7cf0f7498a840fd6a0e5 e4>

Inclusive  $J/\psi$  production is studied in Xe–Xe interactions at a centre-of-mass energy per nucleon pair of  $\sqrt{s_{NN}}=5.44$  TeV, using the ALICE detector at the CERN LHC. The  $J/\psi$  meson is reconstructed via its decay into a muon pair, in the centre-of-mass rapidity interval  $2.5 \leq y \leq 4$  and down to zero transverse momentum. In this Letter, the nuclear modification factors RAA for inclusive  $J/\psi$  measured in the centrality range 0–90% as well as in the centrality intervals 0–20% and 20–90% are presented. The RAA values are compared to previously published results for Pb–Pb collisions at  $\sqrt{s_{NN}}=5.02$  TeV and to the calculation of a transport model. A good agreement is found between Xe–Xe and Pb–Pb results as well as between data and the model. © 2018 Organisation européenne pour la recherche nucléaire

**CMS Collaboration. (2018). Constraints on models of scalar and vector leptoquarks decaying to a quark and a neutrino at  $\sqrt{s}=13$  TeV. Physical Review D, 98(3).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0->



[85053014490&doi=10.1103%2fPhysRevD.98.032005&partnerID=40&md5=0a37f1bb30d022ddaa2f71fb666b3c7a](https://doi.org/10.1103/PhysRevD.98.032005)

The results of a previous search by the CMS Collaboration for squarks and gluinos are reinterpreted to constrain models of leptoquark (LQ) production. The search considers jets in association with a transverse momentum imbalance, using the  $MT_2$  variable. The analysis uses proton-proton collision data at  $\sqrt{s}=13$  TeV, recorded with the CMS detector at the LHC in 2016 and corresponding to an integrated luminosity of 35.9 fb<sup>-1</sup>. Leptoquark pair production is considered with LQ decays to a neutrino and a top, bottom, or light quark. This reinterpretation considers higher mass values than the original CMS search to constrain both scalar and vector LQs. Limits on the cross section for LQ pair production are derived at the 95% confidence level depending on the LQ decay mode. A vector LQ decaying with a 50% branching fraction to  $t\nu$ , and 50% to  $b\tau$ , has been proposed as part of an explanation of anomalous flavor physics results. In such a model, using only the decays to  $t\nu$ , LQ masses below 1530 GeV are excluded assuming the Yang-Mills case with coupling  $\kappa=1$ , or 1115 GeV in the minimal coupling case  $\kappa=0$ , placing the most stringent constraint to date from pair production of vector LQs. © 2018 CERN.

**CMS Collaboration. (2018). Elliptic Flow of Charm and Strange Hadrons in High-Multiplicity p+Pb Collisions at  $\sqrt{s_{NN}}=8.16$  TeV. *Physical Review Letters*, 121(8).**

[http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052837614&doi=10.1103%2fPhysRevLett.121.082301&partnerID=40&md5=2ad46f46a48e2d79e6539df169372c51](http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052837614&doi=10.1103/PhysRevLett.121.082301&partnerID=40&md5=2ad46f46a48e2d79e6539df169372c51)

The elliptic azimuthal anisotropy coefficient ( $v_2$ ) is measured for charm ( $D_0$ ) and strange ( $K_S^0$ ,  $\Lambda$ ,  $\Xi^-$ , and  $\Omega^-$ ) hadrons, using a data sample of p+Pb collisions collected by the CMS experiment, at a nucleon-nucleon center-of-mass energy of  $\sqrt{s_{NN}}=8.16$  TeV. A significant positive  $v_2$  signal from long-range azimuthal correlations is observed for all particle species in high-multiplicity p+Pb collisions. The measurement represents the first observation of possible long-range collectivity for open heavy flavor hadrons in small systems. The results suggest that charm quarks have a smaller  $v_2$  than the lighter quarks, probably reflecting a weaker collective behavior. This effect is not seen in the larger PbPb collision system at  $\sqrt{s_{NN}}=5.02$  TeV, also presented. © 2018 CERN.

**CMS Collaboration. (2018). Measurement of charged particle spectra in minimum-bias events from proton-proton collisions at  $\sqrt{s}=13$  TeV. *European Physical Journal C*, 78(9).**

[http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052628288&doi=10.1140%2fepjc%2fs10052-018-6144-y&partnerID=40&md5=a18559e1ade6eb8a6e8a569acf575a62](http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052628288&doi=10.1140/epjc%2fs10052-018-6144-y&partnerID=40&md5=a18559e1ade6eb8a6e8a569acf575a62)

Pseudorapidity, transverse momentum, and multiplicity distributions are measured in the pseudorapidity range  $|\eta| < 2.4$  for charged particles with transverse momenta satisfying  $p_T > 0.5$  GeV in proton-proton collisions at a center-of-mass energy of  $\sqrt{s}=13$  TeV. Measurements are presented in three different event categories. The most inclusive of the categories corresponds to an inelastic p p data set, while the other two categories are exclusive subsets of the inelastic sample that are either enhanced or depleted in single diffractive dissociation events. The measurements are compared to predictions from Monte Carlo event generators used to describe high-energy hadronic interactions in collider and cosmic-ray physics. © 2018, The Author(s).

**CMS Collaboration. (2018). Measurement of the weak mixing angle using the forward–backward asymmetry of Drell–Yan events in p p collisions at 8 TeV. European Physical Journal C, 78(9).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052621603&doi=10.1140%2fepjc%2fs10052-018-6148-7&partnerID=40&md5=ca20f927969503d0b38062bcbf06a43e>

A measurement is presented of the effective leptonic weak mixing angle ( $\sin^2\theta_{\text{eff}}^{\ell}$ ) using the forward–backward asymmetry of Drell–Yan lepton pairs ( $\mu\mu$  and  $e e$ ) produced in proton–proton collisions at  $s=8\text{TeV}$  at the CMS experiment of the LHC. The data correspond to integrated luminosities of  $18.8$  and  $19.6\text{fb}^{-1}$  in the dimuon and dielectron channels, respectively, containing  $8.2$  million dimuon and  $4.9$  million dielectron events. With more events and new analysis techniques, including constraints obtained on the parton distribution functions from the measured forward–backward asymmetry, the statistical and systematic uncertainties are significantly reduced relative to previous CMS measurements. The extracted value of  $\sin^2\theta_{\text{eff}}^{\ell}$  from the combined dilepton data is  $\sin^2\theta_{\text{eff}}^{\ell}=0.23101\pm 0.00036(\text{stat})\pm 0.00018(\text{syst})\pm 0.00016(\text{theo})\pm 0.00031(\text{parton distributions in proton})=0.23101\pm 0.00053$ . © 2018, CERN for the benefit of the CMS collaboration.

**CMS Collaboration. (2018). Measurement of the  $Z / \gamma^* \rightarrow \tau\tau$  cross section in pp collisions at  $\sqrt{s}=13\text{TeV}$  and validation of  $\tau$  lepton analysis techniques. European Physical Journal C, 78(9).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052730497&doi=10.1140%2fepjc%2fs10052-018-6146-9&partnerID=40&md5=bb0fadbf3d501d2e6da2337456369947>

A measurement is presented of the  $Z / \gamma^* \rightarrow \tau\tau$  cross section in pp collisions at  $s=13\text{TeV}$ , using data recorded by the CMS experiment at the LHC, corresponding to an integrated luminosity of  $2.3\text{fb}^{-1}$ . The product of the inclusive cross section and branching fraction is measured to be  $\sigma(\text{pp} \rightarrow Z/\gamma^* + X) \text{B}(Z/\gamma^* \rightarrow \tau\tau) = 1848 \pm 12(\text{stat}) \pm 67(\text{syst}, +, \text{lumi}) \text{ pb}$ , in agreement with the standard model expectation, computed at next-to-next-to-leading order accuracy in perturbative quantum chromodynamics. The measurement is used to validate new analysis techniques relevant for future measurements of  $\tau$  lepton production. The measurement also provides the reconstruction efficiency and energy scale for  $\tau$  decays to hadrons+ $\nu_{\tau}$  final states, determined with respective relative uncertainties of  $2.2$  and  $0.9\%$ . © 2018, CERN for the benefit of the CMS collaboration.

**CMS Collaboration. (2018). Observation of Higgs Boson Decay to Bottom Quarks. Physical Review Letters, 121(12).** <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054036077&doi=10.1103%2fPhysRevLett.121.121801&partnerID=40&md5=8ca17e2d4497a133170ccc1a3d3805ee>

The observation of the standard model (SM) Higgs boson decay to a pair of bottom quarks is presented. The main contribution to this result is from processes in which Higgs bosons are produced in association with a W or Z boson (VH), and are searched for in final states including 0, 1, or 2 charged leptons and two identified bottom quark jets. The results from the measurement of these processes in a data sample recorded by the CMS experiment in 2017, comprising  $41.3 \text{fb}^{-1}$  of proton-proton collisions at  $s=13 \text{TeV}$ , are described. When combined with previous VH measurements using data collected at  $s=7, 8, \text{ and } 13 \text{TeV}$ , an excess of events is observed at  $m_H=125 \text{GeV}$  with a significance of  $4.8$  standard deviations, where the expectation for the SM Higgs

boson is 4.9. The corresponding measured signal strength is  $1.01 \pm 0.22$ . The combination of this result with searches by the CMS experiment for  $H \rightarrow bb$  in other production processes yields an observed (expected) significance of 5.6 (5.5) standard deviations and a signal strength of  $1.04 \pm 0.20$ . © 2018 CERN.

**CMS Collaboration. (2018). Observation of the  $\chi_{b1}$  (3P) and  $\chi_{b2}$  (3P) and Measurement of their Masses. Physical Review Letters, 121(9).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053284118&doi=10.1103%2fPhysRevLett.121.092002&partnerID=40&md5=944b37ca0f6a38082ac80069c41b6391>

The  $\chi_{b1}(3P)$  and  $\chi_{b2}(3P)$  states are observed through their  $(3S)\gamma$  decays, using an event sample of proton-proton collisions collected by the CMS experiment at the CERN LHC. The data were collected at a center-of-mass energy of 13 TeV and correspond to an integrated luminosity of 80.0 fb<sup>-1</sup>. The  $(3S)$  mesons are identified through their dimuon decay channel, while the low-energy photons are detected after converting to  $e^+e^-$  pairs in the silicon tracker, leading to a  $\chi_b(3P)$  mass resolution of 2.2 MeV. This is the first time that the  $J=1$  and 2 states are well resolved and their masses individually measured:  $10513.42 \pm 0.41(\text{stat}) \pm 0.18(\text{syst})$  MeV and  $10524.02 \pm 0.57(\text{stat}) \pm 0.18(\text{syst})$  MeV; they are determined with respect to the world-average value of the  $\sim(3S)$  mass, which has an uncertainty of 0.5 MeV. The mass splitting is measured to be  $10.60 \pm 0.64(\text{stat}) \pm 0.17(\text{syst})$  MeV. © 2018 CERN.

**CMS Collaboration. (2018). Operational experience with the GEM detector assembly lines for the CMS forward muon upgrade. IEEE Transactions on Nuclear Science, (article in press).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053603478&doi=10.1109%2fTNS.2018.2871428&partnerID=40&md5=f7df1a24a89fc96a9b0593b34fe25408>

The CMS Collaboration has been developing large-area Triple-GEM detectors to be installed in the muon Endcap regions of the CMS experiment in 2019 to maintain forward muon trigger and tracking performance at the HL-LHC. Ten preproduction detectors were built at CERN to commission the first assembly line and the quality controls. These were installed in the CMS detector in early 2017 and participated in the 2017 LHC run. The collaboration has prepared several additional assembly and quality control lines for distributed mass production of 160 GEM detectors at various sites worldwide. During 2017, these additional production sites have optimized construction techniques and quality control procedures and validated them against common specifications by constructing additional preproduction detectors. Using the specific experience from one production site as an example, we discuss how the quality controls make use of independent hardware and trained personnel to ensure fast and reliable production. Preliminary results on the construction status of CMS GEM detectors are presented with details of the assembly sites involvement. IEEE

**CMS Collaboration. (2018). Search for a heavy resonance decaying into a Z boson and a Z or W boson in 2ℓ2q final states at  $\sqrt{s}=13$  TeV. Journal of High Energy Physics, 2018(9).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053662303&doi=10.1007%2fJHEP09%282018%29101&partnerID=40&md5=20ce0f5b4597f89fdbf885eba749d7f2>

A search has been performed for heavy resonances decaying to ZZ or ZW in  $2\ell 2q$  final states, with two charged leptons ( $\ell = e, \mu$ ) produced by the decay of a Z boson, and two quarks produced by the decay of a W or Z boson. The analysis is sensitive to resonances with masses in the range from 400 to 4500 GeV. Two categories are defined based on the merged or resolved reconstruction of the hadronically decaying vector boson, optimized for high- and low-mass resonances, respectively. The search is based on data collected during 2016 by the CMS experiment at the LHC in proton-proton collisions with a center-of-mass energy of  $\sqrt{s}=13$  TeV, corresponding to an integrated luminosity of  $35.9 \text{ fb}^{-1}$ . No excess is observed in the data above the standard model background expectation. Upper limits on the production cross section of heavy, narrow spin-1 and spin-2 resonances are derived as a function of the resonance mass, and exclusion limits on the production of  $W'$  bosons and bulk graviton particles are calculated in the framework of the heavy vector triplet model and warped extra dimensions, respectively. [Figure not available: see fulltext.] © 2018, The Author(s).

**CMS Collaboration. (2018). Search for additional neutral MSSM Higgs bosons in the  $\tau\tau$  final state in proton-proton collisions at  $\sqrt{s}=13$  TeV. *Journal of High Energy Physics*, 2018(9).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053005504&doi=10.1007%2fJHEP09%282018%29007&partnerID=40&md5=a10a284154da65bb8b085e9766a27926>

A search is presented for additional neutral Higgs bosons in the  $\tau\tau$  final state in proton-proton collisions at the LHC. The search is performed in the context of the minimal supersymmetric extension of the standard model (MSSM), using the data collected with the CMS detector in 2016 at a center-of-mass energy of 13 TeV, corresponding to an integrated luminosity of  $35.9 \text{ fb}^{-1}$ . To enhance the sensitivity to neutral MSSM Higgs bosons, the search includes production of the Higgs boson in association with b quarks. No significant deviation above the expected background is observed. Model-independent limits at 95% confidence level (CL) are set on the product of the branching fraction for the decay into  $\tau$  leptons and the cross section for the production via gluon fusion or in association with b quarks. These limits range from 18 pb at 90 GeV to 3.5 fb at 3.2 TeV for gluon fusion and from 15 pb (at 90 GeV) to 2.5 fb (at 3.2 TeV) for production in association with b quarks, assuming a narrow width resonance. In the  $m_h$   $\text{mod} +$  scenario these limits translate into a 95% CL exclusion of  $\tan\beta > 6$  for neutral Higgs boson masses below 250 GeV, where  $\tan\beta$  is the ratio of the vacuum expectation values of the neutral components of the two Higgs doublets. The 95% CL exclusion contour reaches 1.6 TeV for  $\tan\beta = 60$ . [Figure not available: see fulltext.] © 2018, The Author(s).

**CMS Collaboration. (2018). Search for an exotic decay of the Higgs boson to a pair of light pseudoscalars in the final state with two b quarks and two  $\tau$  leptons in proton-proton collisions at  $\sqrt{s}=13$  TeV. *Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics*, 785, 462-488.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053468138&doi=10.1016%2fj.physletb.2018.08.057&partnerID=40&md5=984fe39ca8029ea5d05f439edb08017a>

A search for an exotic decay of the Higgs boson to a pair of light pseudoscalar bosons is performed for the first time in the final state with two b quarks and two  $\tau$  leptons. The search is motivated in the context of models of physics beyond the standard model (SM), such as two Higgs doublet models extended with a complex scalar singlet (2HDM + S), which include the next-to-minimal supersymmetric SM (NMSSM). The results are based on a data set of proton-proton collisions corresponding to an integrated luminosity of  $35.9 \text{ fb}^{-1}$ , accumulated by the

CMS experiment at the LHC in 2016 at a center-of-mass energy of 13 TeV. Masses of the pseudoscalar boson between 15 and 60 GeV are probed, and no excess of events above the SM expectation is observed. Upper limits between 3 and 12% are set on the branching fraction  $B(h \rightarrow aa \rightarrow 2\tau 2b)$  assuming the SM production of the Higgs boson. Upper limits are also set on the branching fraction of the Higgs boson to two light pseudoscalar bosons in different 2HDM + S scenarios. Assuming the SM production cross section for the Higgs boson, the upper limit on this quantity is as low as 20% for a mass of the pseudoscalar of 40 GeV in the NMSSM. © 2018 The Author(s)

**CMS Collaboration. (2018). Search for dark matter produced in association with a Higgs boson decaying to  $\gamma$  or  $\tau + \tau -$  at  $\sqrt{s}=13$  TeV. *Journal of High Energy Physics*, 2018(9).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053262561&doi=10.1007%2fJHEP09%282018%29046&partnerID=40&md5=dc76c81eb2ec7270f25a920b90e66833>

A search for dark matter particles is performed by looking for events with large transverse momentum imbalance and a recoiling Higgs boson decaying to either a pair of photons or a pair of  $\tau$  leptons. The search is based on proton-proton collision data at a center-of-mass energy of 13 TeV collected at the CERN LHC in 2016 and corresponding to an integrated luminosity of 35.9 fb<sup>-1</sup>. No significant excess over the expected standard model background is observed. Upper limits at 95% confidence level are presented for the product of the production cross section and branching fraction in the context of two benchmark simplified models. For the Z'-two-Higgs-doublet model (where Z' is a new massive boson mediator) with an intermediate heavy pseudoscalar particle of mass  $m_A = 300$  GeV and  $m_{DM} = 100$  GeV, the Z' masses from 550 GeV to 1265 GeV are excluded. For a baryonic Z' model, with  $m_{DM} = 1$  GeV, Z' masses up to 615 GeV are excluded. Results are also presented for the spin-independent cross section for the dark matter-nucleon interaction as a function of the mass of the dark matter particle. This is the first search for dark matter particles produced in association with a Higgs boson decaying to two  $\tau$  leptons. [Figure not available: see fulltext.]. © 2018, The Author(s).

**CMS Collaboration. (2018). Search for narrow and broad dijet resonances in proton-proton collisions at  $\sqrt{s}=13$  TeV and constraints on dark matter mediators and other new particles. *Journal of High Energy Physics*,**

**2018(8).** <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052611303&doi=10.1007%2fJHEP08%282018%29130&partnerID=40&md5=91d16ec41c7246fee5f3c5c9d671743a>

Searches for resonances decaying into pairs of jets are performed using proton-proton collision data collected at  $\sqrt{s}=13$  TeV corresponding to an integrated luminosity of up to 36 fb<sup>-1</sup>. A low-mass search, for resonances with masses between 0.6 and 1.6 TeV, is performed based on events with dijets reconstructed at the trigger level from calorimeter information. A high-mass search, for resonances with masses above 1.6 TeV, is performed using dijets reconstructed offline with a particle-flow algorithm. The dijet mass spectrum is well described by a smooth parameterization and no evidence for the production of new particles is observed. Upper limits at 95% confidence level are reported on the production cross section for narrow resonances with masses above 0.6 TeV. In the context of specific models, the limits exclude string resonances with masses below 7.7 TeV, scalar diquarks below 7.2 TeV, axigluons and colorons below 6.1 TeV, excited quarks below 6.0 TeV, color-octet scalars below 3.4 TeV, W' bosons below 3.3 TeV, Z' bosons below 2.7 TeV, Randall-Sundrum gravitons below 1.8 TeV and in the range 1.9 to 2.5 TeV, and dark matter mediators below 2.6 TeV. The limits on both vector and axial-vector mediators, in a simplified model of interactions between quarks and dark matter particles, are presented

as functions of dark matter particle mass and coupling to quarks. Searches are also presented for broad resonances, including for the first time spin-1 resonances with intrinsic widths as large as 30% of the resonance mass. The broad resonance search improves and extends the exclusions of a dark matter mediator to larger values of its mass and coupling to quarks.[Figure not available: see fulltext.]. © 2018, The Author(s).

**CMS Collaboration. (2018). Search for new physics in dijet angular distributions using proton–proton collisions at  $\sqrt{s}=13\text{TeV}$  and constraints on dark matter and other models. *European Physical Journal C*, 78(9).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053928588&doi=10.1140%2fepjc%2fs10052-018-6242-x&partnerID=40&md5=b2e92dffe068bae22e887647f9380cad>

A search is presented for physics beyond the standard model, based on measurements of dijet angular distributions in proton–proton collisions at  $s=13\text{TeV}$ . The data collected with the CMS detector at the LHC correspond to an integrated luminosity of  $35.9\text{fb}^{-1}$ . The observed distributions, corrected to particle level, are found to be in agreement with predictions from perturbative quantum chromodynamics that include electroweak corrections. Constraints are placed on models containing quark contact interactions, extra spatial dimensions, quantum black holes, or dark matter, using the detector-level distributions. In a benchmark model where only left-handed quarks participate, contact interactions are excluded at the 95% confidence level up to a scale of 12.8 or 17.5TeV, for destructive or constructive interference, respectively. The most stringent lower limits to date are set on the ultraviolet cutoff in the Arkani–Hamed–Dimopoulos–Dvali model of extra dimensions. In the Giudice–Rattazzi–Wells convention, the cutoff scale is excluded up to 10.1TeV. The production of quantum black holes is excluded for masses below 5.9 and 8.2TeV, depending on the model. For the first time, lower limits between 2.0 and 4.6TeV are set on the mass of a dark matter mediator for (axial-)vector mediators, for the universal quark coupling  $g_q = 1.0$ . © 2018, CERN for the benefit of the CMS collaboration.

**CMS Collaboration. (2018). Search for third-generation scalar leptoquarks decaying to a top quark and a  $\tau$  lepton at  $\sqrt{s}=13\text{TeV}$ . *European Physical Journal C*, 78(9).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052741118&doi=10.1140%2fepjc%2fs10052-018-6143-z&partnerID=40&md5=609bd80ba2e5684d8b1cb38835af7194>

A search for pair production of heavy scalar leptoquarks (LQs), each decaying into a top quark and a  $\tau$  lepton, is presented. The search considers final states with an electron or a muon, one or two  $\tau$  leptons that decayed to hadrons, and additional jets. The data were collected in 2016 in proton–proton collisions at  $s=13\text{TeV}$  with the CMS detector at the LHC, and correspond to an integrated luminosity of  $35.9\text{fb}^{-1}$ . No evidence for pair production of LQs is found. Assuming a branching fraction of unity for the decay  $LQ \rightarrow t \tau$ , upper limits on the production cross section are set as a function of LQ mass, excluding masses below 900GeV at 95% confidence level. These results provide the most stringent limits to date on the production of scalar LQs that decay to a top quark and a  $\tau$  lepton. © 2018, CERN for the benefit of the CMS collaboration.

**CMS Collaboration. (2018). Search for top squarks decaying via four-body or chargino-mediated modes in single-lepton final states in proton-proton collisions at  $\sqrt{s}=13\text{TeV}$ . *Journal of High Energy Physics*, 2018(9).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0->

[85053433287&doi=10.1007%2fJHEP09%282018%29065&partnerID=40&md5=62326f9f857000219dd790427638c473](https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053433287&doi=10.1007%2fJHEP09%282018%29065&partnerID=40&md5=62326f9f857000219dd790427638c473)

A search for the pair production of the lightest supersymmetric partner of the top quark ( $t \sim 1$ ) is presented. The search focuses on a compressed scenario where the mass difference between the top squark and the lightest supersymmetric particle, often considered to be the lightest neutralino ( $\chi \sim 10$ ), is smaller than the mass of the W boson. The proton-proton collision data were recorded by the CMS experiment at a centre-of-mass energy of 13 TeV, and correspond to an integrated luminosity of 35.9 fb<sup>-1</sup>. In this search, two decay modes of the top squark are considered: a four-body decay into a bottom quark, two additional fermions, and a  $\chi \sim 10$ ; and a decay via an intermediate chargino. Events are selected using the presence of a high-momentum jet, significant missing transverse momentum, and a low transverse momentum electron or muon. Two analysis techniques are used, targeting different decay modes of the  $t \sim 1$ : a sequential selection and a multivariate technique. No evidence for the production of top squarks is found, and mass limits at 95% confidence level are set that reach up to 560 GeV, depending on the  $m(t \sim 1) - m(\chi \sim 10)$  mass difference and the decay mode. [Figure not available: see fulltext.] © 2018, The Author(s).

**CMS Collaboration. (2018). Search for vector-like T and B quark pairs in final states with leptons at  $\sqrt{s}=13$  TeV. *Journal of High Energy Physics*, 2018(8).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052839755&doi=10.1007%2fJHEP08%282018%29177&partnerID=40&md5=345d11d4457bbe330eff57cfa919df2>

A search is presented for pair production of heavy vector-like T and B quarks in proton-proton collisions at  $\sqrt{s}=13$  TeV. The data sample corresponds to an integrated luminosity of 35.9 fb<sup>-1</sup>, collected with the CMS detector at the CERN LHC in 2016. Pair production of T quarks would result in a wide range of final states, since vector-like T quarks of charge  $2e/3$  are predicted to decay to  $bW$ ,  $tZ$ , and  $tH$ . Likewise, vector-like B quarks are predicted to decay to  $tW$ ,  $bZ$ , and  $bH$ . Three channels are considered, corresponding to final states with a single lepton, two leptons with the same sign of the electric charge, or at least three leptons. The results exclude T quarks with masses below 1140–1300 GeV and B quarks with masses below 910–1240 GeV for various branching fraction combinations, extending the reach of previous CMS searches by 200–600 GeV. [Figure not available: see fulltext.]. © 2018, The Author(s).

**in 't Zand, J. J. M., Bozzo, E., Qu, J. L., Li, X. D., Amati, L., Chen, Y., . . . Zingale, M. (2019). Observatory science with eXTP. *Science China: Physics, Mechanics and Astronomy*, 62(2).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052723351&doi=10.1007%2fs11433-017-9186-1&partnerID=40&md5=82c1eb8b76a202d285280dde1dc81823>

In this White Paper we present the potential of the enhanced X-ray Timing and Polarimetry (eXTP) mission for studies related to Observatory Science targets. These include flaring stars, supernova remnants, accreting white dwarfs, low and high mass X-ray binaries, radio quiet and radio loud active galactic nuclei, tidal disruption events, and gamma-ray bursts. eXTP will be excellently suited to study one common aspect of these objects: their often transient nature. Developed by an international Consortium led by the Institute of High Energy

Physics of the Chinese Academy of Science, the eXTP mission is expected to be launched in the mid 2020s. © 2018, Science China Press and Springer-Verlag GmbH Germany, part of Springer Nature.

**Lewis, P. M., Jaegle, I., Nakayama, H., Aloisio, A., Ameli, F., Barrett, M., . . . Yokoyama, S. (2018). First measurements of beam backgrounds at SuperKEKB. Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, (article in press).**  
<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053324797&doi=10.1016%2fj.nima.2018.05.071&partnerID=40&md5=3859f028d0d2aad101f04a90c1a52d93>

The high design luminosity of the SuperKEKB electron–positron collider is expected to result in challenging levels of beam-induced backgrounds in the interaction region. Properly simulating and mitigating these backgrounds is critical to the success of the Belle II experiment. We report on measurements performed with a suite of dedicated beam background detectors, collectively known as BEAST II, during the so-called Phase 1 commissioning run of SuperKEKB in 2016, which involved operation of both the high energy ring (HER) of 7 GeV electrons as well as the low energy ring (LER) of 4 GeV positrons. We describe the BEAST II detector systems, the simulation of beam backgrounds, and the measurements performed. The measurements include standard ones of dose rates versus accelerator conditions, and more novel investigations, such as bunch-by-bunch measurements of injection backgrounds and measurements sensitive to the energy spectrum and angular distribution of fast neutrons. We observe beam–gas, Touschek, beam–dust, and injection backgrounds. As there is no final focus of the beams in Phase 1, we do not observe significant synchrotron radiation, as expected. Measured LER beam–gas backgrounds and Touschek backgrounds in both rings are slightly elevated, on average three times larger than the levels predicted by simulation. HER beam–gas backgrounds are on average two orders of magnitude larger than predicted. Systematic uncertainties and channel-to-channel variations are large, so that these excesses constitute only 1–2 sigma level effects. Neutron background rates are higher than predicted and should be studied further. We will measure the remaining beam background processes, due to colliding beams, in the imminent commissioning Phase 2. These backgrounds are expected to be the most critical for Belle II, to the point of necessitating replacement of detector components during the Phase 3 (full-luminosity) operation of SuperKEKB. © 2018 Elsevier B.V.

**Star Collaboration. (2018). Collision energy dependence of moments of net-kaon multiplicity distributions at RHIC. Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics, 785, 551-560.**  
<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053450515&doi=10.1016%2fj.physletb.2018.07.066&partnerID=40&md5=1e56284f2f962b6432c66af1e0c13892>

Fluctuations of conserved quantities such as baryon number, charge, and strangeness are sensitive to the correlation length of the hot and dense matter created in relativistic heavy-ion collisions and can be used to search for the QCD critical point. We report the first measurements of the moments of net-kaon multiplicity distributions in Au+Au collisions at  $\sqrt{s_{NN}}=7.7, 11.5, 14.5, 19.6, 27, 39, 62.4,$  and 200 GeV. The collision centrality and energy dependence of the mean ( $M$ ), variance ( $\sigma^2$ ), skewness ( $S$ ), and kurtosis ( $\kappa$ ) for net-kaon multiplicity distributions as well as the ratio  $\sigma^2/M$  and the products  $S\sigma$  and  $\kappa\sigma^2$  are presented. Comparisons are made with Poisson and negative binomial baseline calculations as well as with UrQMD, a transport model (UrQMD) that does not include effects from the QCD critical point. Within current uncertainties, the net-kaon cumulant ratios appear to be monotonic as a function of collision energy. © 2018 The Author



**Star Collaboration. (2018). J/ψ production cross section and its dependence on charged-particle multiplicity in p + p collisions at s=200 GeV. Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics, 786, 87-93. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053917354&doi=10.1016%2fj.physletb.2018.09.029&partnerID=40&md5=741eb9e6f4c69eb1fe2fdd5457fb00d1>**

We present a measurement of inclusive J/ψ production at mid-rapidity ( $|\eta| < 1$ ) in p+p collisions at a center-of-mass energy of s=200 GeV with the STAR experiment at the Relativistic Heavy Ion Collider (RHIC). The differential production cross section for J/ψ as a function of transverse momentum (pT) for  $0 < pT < 14$  GeV/c and the total cross section are reported and compared to calculations from the color evaporation model and the non-relativistic Quantum Chromodynamics model. The dependence of J/ψ relative yields in three pT intervals on charged-particle multiplicity at mid-rapidity is measured for the first time in p+p collisions at s=200 GeV and compared with that measured at s=7 TeV, PYTHIA8 and EPOS3 Monte Carlo generators, and the Percolation model prediction. © 2018 The Author(s)

**Star Collaboration. (2018). Longitudinal double-spin asymmetries for dijet production at intermediate pseudorapidity in polarized pp collisions at s =200 GeV. Physical Review D, 98(3). <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052985524&doi=10.1103%2fPhysRevD.98.032011&partnerID=40&md5=579cb183935bc179c54d8bc5d5c544c8>**

We present the first measurements of the longitudinal double-spin asymmetry ALL for dijets with at least one jet reconstructed within the pseudorapidity range  $0.8 < \eta < 1.8$ . The dijets were measured in polarized pp collisions at a center-of-mass energy s=200 GeV. Values for ALL are determined for several distinct event topologies, defined by the jet pseudorapidities, and span a range of parton momentum fraction x down to  $x \sim 0.01$ . The measured asymmetries are found to be consistent with the predictions of global analyses that incorporate the results of previous RHIC measurements. They will provide new constraints on  $\Delta g(x)$  in this poorly constrained region when included in future global analyses. © 2018 authors. Published by the American Physical Society.

**Star Collaboration. (2018). Longitudinal double-spin asymmetries for π0 s in the forward direction for 510 GeV polarized pp collisions LONGITUDINAL DOUBLE-SPIN ASYMMETRIES for ... J. ADAM et al. Physical Review D, 98(3). <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85052992572&doi=10.1103%2fPhysRevD.98.032013&partnerID=40&md5=4e2fe58575196ba2f3b5edb7586d3faf>**

The STAR Collaboration reports measurements of the longitudinal double-spin asymmetry, ALL, for neutral pions produced at forward directions in polarized proton-proton collisions, at a center-of-mass energy of 510 GeV. Results are given for transverse momenta in the range  $2 < pT < 10$  GeV/c within two regions of pseudorapidity that span  $2.65 < \eta < 3.9$ . These results are sensitive to the polarized gluon parton distribution function,  $\Delta g(x)$ , down to the region of Bjorken  $x \sim 10^{-3}$ . The asymmetries observed are less than  $\pm 5 \times 10^{-3}$  in magnitude and will help constrain the contribution to the spin of the proton from polarized gluons at low x, when combined with other measurements as part of a global analysis. © 2018 authors. Published by the American Physical Society.

**Star Collaboration. (2018). Low- $p_T$   $e^+e^-$  Pair Production in Au +Au Collisions at  $\sqrt{s_{NN}}=200$  GeV and U + U Collisions at  $\sqrt{s_{NN}}=193$  GeV at STAR. *Physical Review Letters*, 121(13).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054011284&doi=10.1103/PhysRevLett.121.132301&partnerID=40&md5=8a6d0374a6a59f36c0d25b5ca2d59289>

We report first measurements of  $e^+e^-$  pair production in the mass region  $0.4 < M_{ee} < 2.6$  GeV/c<sup>2</sup> at low transverse momentum ( $p_T < 0.15$  GeV/c) in noncentral Au+Au collisions at  $\sqrt{s_{NN}}=200$  GeV and U+U collisions at  $\sqrt{s_{NN}}=193$  GeV. Significant enhancement factors, expressed as ratios of data over known hadronic contributions, are observed in the 40%-80% centrality of these collisions. The excess yields peak distinctly at low  $p_T$  with a width ( $\Delta p_T \approx \text{©}$ ) between 40 and 60 MeV/c. The absolute cross section of the excess depends weakly on centrality, while those from a theoretical model calculation incorporating an in-medium broadened  $\rho$  spectral function and radiation from a quark gluon plasma or hadronic cocktail contributions increase dramatically with an increasing number of participant nucleons. Model calculations of photon-photon interactions generated by the initial projectile and target nuclei describe the observed excess yields but fail to reproduce the  $p_T^2$  distributions. © 2018 authors. Published by the American Physical Society. Published by the American Physical Society under the terms of the »<https://creativecommons.org/licenses/by/4.0/>» Creative Commons Attribution 4.0 International license. Further distribution of this work must maintain attribution to the author(s) and the published article's title, journal citation, and DOI. Funded by SCOAP<sup>3</sup>.

**McHardy, I. M., Connolly, S. D., Horne, K., Cackett, E. M., Gelbord, J., Peterson, B. M., . . . Ward, M. J. (2018). X-ray/UV/optical variability of NGC 4593 with Swift: Reprocessing of X-rays by an extended reprocessor. *Monthly Notices of the Royal Astronomical Society*, 480(3), 2881-2897.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055251626&doi=10.1093/mnras/sty1983&partnerID=40&md5=d4546445bcc0e501cfd5b1dfc21ba41>

We report the results of intensive X-ray, UV, and optical monitoring of the Seyfert 1 galaxy NGC 4593 with Swift. There is no intrinsic flux-related spectral change in any variable component with small apparent variations being due to contamination by a constant hard (reflection) component in the X-rays and the red host galaxy in the UV/optical. Relative to the shortest wavelength band, UVW2, the lags of the other UV/optical bands mostly agree with the predictions of reprocessing of high energy emission by an accretion disc. The U-band lag is, however, larger than expected, probably because of reprocessed Balmer continuum emission from the distant broad line region (BLR). The UVW2 band is well correlated with the X-rays but lags by  $\sim 6\times$  more than expected if the UVW2 results only from reprocessing of X-rays by the disc. However, if the light curves are filtered to remove variations on time-scales  $> 5$  d, the lag approaches the expectation from disc reprocessing. MEMECHO analysis shows that direct X-rays can be the driver of most of the UV/optical variations if the response functions have tails up to 10 d, from BLR reprocessing, together with strong peaks at short lag ( $< 1$  d) from disc reprocessing. For the 5 AGN monitored so far, the observed UVW2 to V-band lags are  $\lesssim 2$  of disc reprocessing expectations and vary little between AGN. However, the X-ray to UVW2 lags greatly exceed disc reprocessing expectations and differ between AGN. The two most absorbed AGN have the largest excesses, so absorption and scattering may affect these lags, but there is no simple relationship between excess and absorption. © 2018 The Author(s).

**Miller, J. M., Cackett, E., Zoghbi, A., Barret, D., Behar, E., Brenneman, L. W., . . . Raymond, J. (2018). X-Ray Structure between the Innermost Disk and Optical Broad-line Region in NGC 4151. *Astrophysical Journal*,**

**865(2).** <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054864925&doi=10.3847%2f1538-4357%2faadbaa&partnerID=40&md5=401de2328756ce27ed1ac759d3e14cee>

We present an analysis of the narrow Fe K $\alpha$  line in Chandra/HETGS observations of the Seyfert active galactic nucleus (AGN) NGC 4151. The sensitivity and resolution afforded by the gratings reveal asymmetry in this line. Models including weak Doppler boosting, gravitational redshifts, and scattering are generally preferred over Gaussians at the 5 $\sigma$  level of confidence, and generally measure radii consistent with . Separate fits to "high/unobscured" and "low/obscured" phases reveal that the line originates at smaller radii in high-flux states; model-independent tests indicate that this effect is significant at the 4-5 $\sigma$  level. Some models and  $\Delta t \simeq 2 \times 10^4$  s variations in line flux suggest that the narrow Fe K $\alpha$  line may originate at radii as small as in high-flux states. These results indicate that the narrow Fe K $\alpha$  line in NGC 4151 is primarily excited in the innermost part of the optical broad line region (BLR), or X-ray BLR. Alternatively, a warp could provide the solid angle needed to enhance Fe K $\alpha$  line emission from intermediate radii, and might resolve an apparent discrepancy in the inclination of the innermost and outer disk in NGC 4151. Both warps and the BLR may originate through radiation pressure, so these explanations may be linked. We discuss our results in detail, and consider the potential for future observations with Chandra, XARM, and ATHENA to measure black hole masses and to study the intermediate disk in AGNs using narrow Fe K $\alpha$  emission lines. © 2018. The American Astronomical Society. All rights reserved.

**Sandoval, L. E. R., Wijnands, R., Degenaar, N., Cavecchi, Y., Heinke, C. O., Cackett, E. M., . . . Parikh, A. S. (2018).** Extreme quiescent variability of the transient neutron star low-mass X-ray binary EXO 1745-248 in Terzan 5. *Monthly Notices of the Royal Astronomical Society*, **479(2)**, 2777-2788.

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055182355&doi=10.1093%2fMNRAS%2fSTY1535&partnerID=40&md5=8ec9ffbd263c2465d2fab29f14dbb159>

EXO 1745-248 is a transient neutron star low-mass X-ray binary that resides in the globular cluster Terzan 5. We studied the transient during its quiescent state using 18 Chandra observations of the cluster acquired between 2003 and 2016. We found an extremely variable source, with a luminosity variation in the 0.5-10 keV energy range of approximately three orders of magnitude (between  $3 \times 10^{31}$  and  $2 \times 10^{34}$  erg s $^{-1}$ ) on time-scales from years down to only a few days. Using an absorbed power-law model to fit its quiescent spectra, we obtained a typical photon index of  $\sim 1.4$ , indicating that the source is even harder than during outburst and much harder than typical quiescent neutron stars if their quiescent X-ray spectra are also described by a single power-law model. This indicates that EXO 1745-248 is very hard throughout the entire observed X-ray luminosity range. At the highest luminosity, the spectrum fits better when an additional (soft) component is added to the model. All these quiescent properties are likely related to strong variability in the low-level accretion rate in the system. However, its extreme variable behaviour is strikingly different from the one observed for other neutron star transients that are thought to still accrete in quiescence. We compare our results to these systems. We also discuss similarities and differences between our target and the transitional millisecond pulsar IGR J18245-2452, which also has hard spectra and strong variability during quiescence. © 2018 The Author(s).

**Smith, M. J., Cinabro, D., & Naik, P. (2018).** Measurement of the D0  $\rightarrow \omega \eta$  branching fraction with CLEO-c data. *Physical Review D*, **98(5)**.

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054327564&doi=10.1103%2fPhysRevD.98.051101&partnerID=40&md5=8756b8e4bd9d35aae87edbcfbf16a49>

[c](#)

Using CLEO-c data, we confirm the observation of  $D0 \rightarrow \omega \eta$  by BESIII. In the Dalitz plot of  $D0 \rightarrow K S0 \eta \pi 0$ , we find a background in the  $K S0 (\rightarrow \pi^+ \pi^-) \pi 0$  projection with a  $m(\pi^+ \pi^- \pi 0)$  equal to the  $\omega(782)$  mass. In a direct search for  $D0 \rightarrow \omega \eta$  we find a clear signal and measure  $B(D0 \rightarrow \omega \eta) = (1.78 \pm 0.19 \pm 0.15) \times 10^{-3}$ , in good agreement with BESIII. © 2018 American Physical Society.

**Stevens, A. L., Uttley, P., Altamirano, D., Arzoumanian, Z., Bult, P., Cackett, E. M., . . . Eijnden, J. V. D. (2018). A NICER Discovery of a Low-frequency Quasi-periodic Oscillation in the Soft-intermediate State of MAXI J1535-571. *Astrophysical Journal Letters*, 865(2).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054318754&doi=10.3847%2f2041-8213%2faae1a4&partnerID=40&md5=72dd9a0197a3040dc5708924f47b697f>

We present the discovery of a low-frequency  $\approx 5.7$  Hz quasi-periodic oscillation (QPO) feature in observations of the black hole X-ray binary MAXI J1535-571 in its soft-intermediate state, obtained in 2017 September-October by the Neutron Star Interior Composition Explorer. The feature is relatively broad (compared to other low-frequency QPOs; quality factor  $Q \approx 2$ ) and weak (1.9% rms in 3-10 keV), and is accompanied by a weak harmonic and low-amplitude broadband noise. These characteristics identify it as a weak Type A/B QPO, similar to ones previously identified in the soft-intermediate state of the transient black hole X-ray binary XTE J1550-564. The lag-energy spectrum of the QPO shows increasing soft lags toward lower energies, approaching 50 ms at 1 keV (with respect to a 3-10 keV continuum). This large phase shift has similar amplitude but opposite sign to that seen in Rossi X-Ray Timing Explorer data for a Type B QPO from the transient black hole X-ray binary GX 339-4. Previous phase-resolved spectroscopy analysis of the Type B QPO in GX 339-4 pointed toward a precessing jet-like corona illuminating the accretion disk as the origin of the QPO signal. We suggest that this QPO in MAXI J1535-571 may have the same origin, with the different lag sign depending on the scale height of the emitting region and the observer inclination angle. © 2018. The American Astronomical Society. All rights reserved..

**The Alice Collaboration. (2018). Measurements of low-p T electrons from semileptonic heavy-flavour hadron decays at mid-rapidity in pp and Pb-Pb collisions at  $\sqrt{s_{NN}}=2.76$  TeV. *Journal of High Energy Physics*, 2018(10).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055109747&doi=10.1007%2fJHEP10%282018%29061&partnerID=40&md5=3eba47cf0c021f2db66c694278da7048>

Transverse-momentum ( $p_T$ ) differential yields of electrons from semileptonic heavy-flavour hadron decays have been measured in the most central (0–10%) and in semi-central (20–40%) Pb–Pb collisions at  $\sqrt{s_{NN}}=2.76$  TeV. The corresponding production cross section in pp collisions has been measured at the same energy with substantially reduced systematic uncertainties with respect to previously published results. The modification of the yield in Pb–Pb collisions with respect to the expectation from an incoherent superposition of nucleon-nucleon collisions is quantified at mid-rapidity ( $|y| \leq 0.8$ ) in the  $p_T$  interval 0.5–3 GeV/c via the nuclear modification factor, RAA. This paper extends the  $p_T$  reach of the RAA measurement towards significantly lower values with respect to a previous publication. In Pb–Pb collisions the  $p_T$ -differential measurements of yields at low  $p_T$  are essential to investigate the scaling of heavy-flavour production with the number of binary nucleon-nucleon collisions. Heavy-quark hadronization, a collective expansion and even initial-state effects, such as the nuclear modification of the Parton Distribution Function, are also expected to have a significant effect on the measured distribution. © 2018, The Author(s).

**The Alice Collaboration. (2018). Medium modification of the shape of small-radius jets in central Pb-Pb collisions at  $\sqrt{s_{NN}}=2.76$  TeV. *Journal of High Energy Physics*, 2018(10).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055348146&doi=10.1007%2fJHEP10%282018%29139&partnerID=40&md5=8a2fc7e2499702cc0b39cf7771ae4563>

We present the measurement of a new set of jet shape observables for track-based jets in central Pb-Pb collisions at  $\sqrt{s_{NN}}=2.76$  TeV. The set of jet shapes includes the first radial moment or angularity,  $g$ ; the momentum dispersion,  $pTD$ ; and the difference between the leading and sub-leading constituent track transverse momentum,  $LeSub$ . These observables provide complementary information on the jet fragmentation and can constrain different aspects of the theoretical description of jet-medium interactions. The jet shapes were measured for a small resolution parameter  $R = 0.2$  and were fully corrected to particle level. The observed jet shape modifications indicate that in-medium fragmentation is harder and more collimated than vacuum fragmentation as obtained by PYTHIA calculations, which were validated with the measurements of the jet shapes in proton-proton collisions at  $\sqrt{s}=7$  TeV. The comparison of the measured distributions to templates for quark and gluon-initiated jets indicates that in-medium fragmentation resembles that of quark jets in vacuum. We further argue that the observed modifications are not consistent with a totally coherent energy loss picture where the jet loses energy as a single colour charge, suggesting that the medium resolves the jet structure at the angular scales probed by our measurements ( $R = 0.2$ ). Furthermore, we observe that small- $R$  jets can help to isolate purely energy loss effects from other effects that contribute to the modifications of the jet shower in medium such as the correlated background or medium response. [Figure not available: see fulltext.]. © 2018, The Author(s).

**The CMS Collaboration. (2018). Charged-particle nuclear modification factors in XeXe collisions at  $\sqrt{s_{NN}}=5.44$  TeV. *Journal of High Energy Physics*, 2018(10).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055417424&doi=10.1007%2fJHEP10%282018%29138&partnerID=40&md5=1a021aad3929939688f80e82df03baaf>

The differential yields of charged particles having pseudorapidity within  $|\eta| < 1$  are measured using xenon-xenon (XeXe) collisions at  $\sqrt{s_{NN}}=5.44$  TeV. The data, corresponding to an integrated luminosity of  $3.42 \mu\text{b}^{-1}$ , were collected in 2017 by the CMS experiment at the LHC. The yields are reported as functions of collision centrality and transverse momentum,  $p_T$ , from 0.5 to 100 GeV. A previously reported  $p_T$  spectrum from proton-proton collisions at  $\sqrt{s}=5.02$  TeV is used for comparison after correcting for the difference in center-of-mass energy. The nuclear modification factors using this reference,  $R_{AA}^*$ , are constructed and compared to previous measurements and theoretical predictions. In head-on collisions, the  $R_{AA}^*$  has a value of 0.17 in the  $p_T$  range of 6–8 GeV, but increases to approximately 0.7 at 100 GeV. Above  $\approx 6$  GeV, the XeXe data show a notably smaller suppression than previous results for lead-lead (PbPb) collisions at  $\sqrt{s_{NN}}=5.02$  TeV when compared at the same centrality (i.e., the same fraction of total cross section). However, the XeXe suppression is slightly greater than that for PbPb in events having a similar number of participating nucleons. © 2018, The Author(s).

**The CMS Collaboration. (2018). Measurement of the production cross section for single top quarks in association with W bosons in proton-proton collisions at  $\sqrt{s}=13$  TeV. *Journal of High Energy Physics*, 2018(10).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055321108&doi=10.1007%2fJHEP10%282018%29117&partnerID=40&md5=cac9e141c5371e2224f1af736b4a8161>

A measurement is presented of the associated production of a single top quark and a W boson in proton-proton collisions at  $\sqrt{s}=13$  TeV by the CMS Collaboration at the CERN LHC. The data collected corresponds to an

integrated luminosity of  $35.9 \text{ fb}^{-1}$ . The measurement is performed using events with one electron and one muon in the final state along with at least one jet originated from a bottom quark. A multivariate discriminant, exploiting the kinematic properties of the events, is used to separate the signal from the dominant  $t\bar{t}$  background. The measured cross section of  $63.1 \pm 1.8(\text{stat}) \pm 6.4(\text{syst}) \pm 2.1(\text{lumi}) \text{ pb}$  is in agreement with the standard model expectation. [Figure not available: see fulltext.]. © 2018, The Author(s).

**The CMS Collaboration. (2018). Search for Pair-Produced Resonances Each Decaying into at Least Four Quarks in Proton-Proton Collisions at  $\sqrt{s}=13 \text{ TeV}$ . *Physical Review Letters*, 121(14).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055080768&doi=10.1103%2fPhysRevLett.121.141802&partnerID=40&md5=7540cceb7e167c8095193289ec3a76>

This Letter presents the results of a search for pair-produced particles of masses above 100 GeV that each decay into at least four quarks. Using data collected by the CMS experiment at the LHC in 2015-2016, corresponding to an integrated luminosity of  $38.2 \text{ fb}^{-1}$ , reconstructed particles are clustered into two large jets of similar mass, each consistent with four-parton substructure. No statistically significant excess of data over the background prediction is observed in the distribution of average jet mass. Pair-produced squarks with dominant hadronic R-parity-violating decays into four quarks and with masses between 0.10 and 0.72 TeV are excluded at 95% confidence level. Similarly, pair-produced gluinos that decay into five quarks are also excluded with masses between 0.10 and 1.41 TeV at 95% confidence level. These are the first constraints that have been placed on pair-produced particles with masses below 400 GeV that decay into four or five quarks, bridging a significant gap in the coverage of R-parity-violating supersymmetry parameter space. © 2018 CERN. for the CMS Collaboration. Published by the American Physical Society under the terms of the

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**The Star Collaboration. (2018). Harmonic decomposition of three-particle azimuthal correlations at energies available at the BNL Relativistic Heavy Ion Collider. *Physical Review C*, 98(3).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054478287&doi=10.1103%2fPhysRevC.98.034918&partnerID=40&md5=dbf98d66e1a85cba7e5775ccd4ca4a6b>

We present measurements of three-particle correlations for various harmonics in Au+Au collisions at energies ranging from  $\sqrt{s_{NN}}=7.7$  to 200 GeV using the STAR detector. The quantity  $(\cos(m\phi_1+n\phi_2-(m+n)\phi_3))$ , with  $\phi$  being the azimuthal angles of the particles is evaluated as a function of  $\sqrt{s_{NN}}$ , collision centrality, transverse momentum,  $p_T$ , pseudorapidity difference,  $\Delta\eta$ , and harmonics ( $m$  and  $n$ ). These data provide detailed information on global event properties such as the three-dimensional structure of the initial overlap region, the expansion dynamics of the matter produced in the collisions, and the transport properties of the medium. A strong dependence on  $\Delta\eta$  is observed for most harmonic combinations, which is consistent with breaking of longitudinal boost invariance. An interesting energy dependence is observed when one of the harmonics  $m, n$ , or  $m+n$  is equal to two, for which the correlators are dominated by the two-particle correlations relative to the second-harmonic event plane. These measurements can be used to constrain models of heavy-ion collisions over a wide range of temperature and baryon chemical potential. © 2018 American Physical Society.

**Aidala, C., Bailey, V., Beckman, S., Belmont, R., Biggs, C., Blackburn, J., . . . Woody, C. (2018). Design and Beam Test Results for the sPHENIX Electromagnetic and Hadronic Calorimeter Prototypes. *IEEE Transactions on***

**Nuclear Science.** <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056178968&doi=10.1109%2fTNS.2018.2879047&partnerID=40&md5=55e025cab6c65e91466f5626f866e0de2>

The sPHENIX experiment at the Relativistic Heavy Ion Collider (RHIC) will perform high precision measurements of jets and heavy flavor observables for a wide selection of nuclear collision systems, elucidating the microscopic nature of strongly interacting matter ranging from nucleons to the strongly coupled quark-gluon plasma. A prototype of the sPHENIX calorimeter system was tested at the Fermilab Test Beam Facility as experiment T-1044 in the spring of 2016. The electromagnetic calorimeter (EMCal) prototype is composed of scintillating fibers embedded in a mixture of tungsten powder and epoxy. The hadronic calorimeter (HCal) prototype is composed of tilted steel plates alternating with plastic scintillator. Results of the test beam reveal the energy resolution for electrons in the EMCal is  $2.8\% \sqrt{E}$ ;  $15.5\% \sqrt{E}$  and the energy resolution for hadrons in the combined EMCal plus HCal system is  $13.5\% \sqrt{E}$ ;  $64.9\% \sqrt{E}$ . These results demonstrate that the performance of the proposed calorimeter system satisfies the sPHENIX specifications. IEEE

**Belle Collaboration (2017). Search for light tetraquark states in  $\Upsilon(1S)$  and  $\Upsilon(2S)$  decays. *Physical Review D*, 96(11).** <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055810797&doi=10.1103%2fPhysRevD.96.112002&partnerID=40&md5=b59ab0868ef53cee39fad7323f57513a>

We search for the  $J^{PC} = 0^{--}$  and  $1^{--}$  light tetraquark states with masses up to  $2.46 \text{ GeV}/c^2$  in  $\Upsilon(1S)$  and  $\Upsilon(2S)$  decays with data samples of  $\delta 102 \text{ P}$  million and  $\delta 158 \text{ P}$  million events, respectively, collected with the Belle detector. No significant signals are observed in any of the studied production modes, and 90% credibility level (C.L.) upper limits on their branching fractions in  $\Upsilon(1S)$  and  $\Upsilon(2S)$  decays are obtained. The inclusive branching fractions of the  $\Upsilon(1S)$  and  $\Upsilon(2S)$  decays into final states with  $f_1(1285)$  are measured to be  $B(\Upsilon(1S) \rightarrow f_1(1285) \text{ p anything}) = 0.46 \pm 0.13 \text{ (stat.)} \times 10^{-4}$  and  $B(\Upsilon(2S) \rightarrow f_1(1285) \text{ p anything}) = 0.22 \pm 0.15 \text{ (stat.)} \times 10^{-4}$ . The measured  $\chi_{b2} \rightarrow J/\psi \text{ p anything}$  branching fraction is measured to be  $0.150 \pm 0.022 \text{ (stat.)} \times 10^{-3}$ , and 90% C.L. upper limits for the  $\chi_{b0}; \chi_{b1} \rightarrow J/\psi \text{ p anything}$  branching fractions are found to be  $2.3 \times 10^{-3}$  and  $1.1 \times 10^{-3}$ , respectively. For  $B(\chi_{b1} \rightarrow \omega \text{ p anything})$ , the branching fraction is measured to be  $0.49 \pm 0.13 \text{ (stat.)} \pm 0.6 \text{ (syst.)} \times 10^{-2}$ . All results reported here are the first measurements for these modes. © 2017 American Physical Society.

**Belle Collaboration (2018). Evidence of a structure in  $K^0 \Lambda_c^+$  consistent with a charged  $\Xi_c(2930)^+$ , and updated measurement of  $B^0 \rightarrow K^0 \Lambda_c^+ \Lambda_c^-$  at Belle: Belle Collaboration. *European Physical Journal C*, 78(11).** <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056570344&doi=10.1140%2fepjc%2fs10052-018-6425-5&partnerID=40&md5=35194ae55dc4034c71196a22a47d7011>

We report evidence for the charged charmed-strange baryon  $\Xi_c(2930)^+$  with a signal significance of  $3.9\sigma$  with systematic errors included. The charged  $\Xi_c(2930)^+$  is found in its decay to  $KS^0 \Lambda_c^+$  in the substructure of  $B^0 \rightarrow KS^0 \Lambda_c^+ \Lambda_c^-$  decays. The measured mass and width are  $[2942.3 \pm 4.4 \text{ (stat.)} \pm 1.5 \text{ (syst.)}] \text{ MeV}/c^2$  and  $[14.8 \pm 8.8 \text{ (stat.)} \pm 2.5 \text{ (syst.)}] \text{ MeV}$ , respectively, and the product branching fraction is  $B(B^0 \rightarrow \Xi_c(2930)^+ \Lambda_c^-) B(\Xi_c(2930)^+ \rightarrow K^0 \Lambda_c^+) = [2.37 \pm 0.51 \text{ (stat.)} \pm 0.31 \text{ (syst.)}] \times 10^{-4}$ . We also measure  $B(B^0 \rightarrow K^0 \Lambda_c^+ \Lambda_c^-) = [3.99 \pm 0.76 \text{ (stat.)} \pm 0.51 \text{ (syst.)}] \times 10^{-4}$  with greater precision than previous experiments, and present the results of a search for the charmonium-like state  $Y(4660)$  and its spin partner,  $Y_\eta$ , in the  $\Lambda_c^+ \Lambda_c^-$  invariant mass spectrum. No clear signals of the  $Y(4660)$  or  $Y_\eta$  are observed and the 90% credibility level (C.L.) upper limits on their production rates are determined. These measurements are obtained from a sample of  $(772 \pm 11) \times 10^6 B^0$

pairs collected at the  $\Upsilon(4S)$  resonance by the Belle detector at the KEKB asymmetric energy electron-positron collider. © 2018, The Author(s).

**Belle Collaboration (2018). Measurement of  $\eta_c(1S)$ ,  $\eta_c(2S)$ , and nonresonant  $\eta'\pi^+\pi^-$  production via two-photon collisions. *Physical Review D*, 98(7).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056185657&doi=10.1103%2fPhysRevD.98.072001&partnerID=40&md5=d84ce253d01b738062408ddb8a1fc367>

We report the measurement of  $\gamma\gamma\rightarrow\eta_c(1S),\eta_c(2S)\rightarrow\eta'\pi^+\pi^-$  with  $\eta'$  decays to  $\gamma\rho$  and  $\eta\pi^+\pi^-$  using 941 fb<sup>-1</sup> of data collected with the Belle detector at the KEKB asymmetric-energy e<sup>+</sup>e<sup>-</sup> collider. The  $\eta_c(1S)$  mass and width are measured to be  $M=[2984.6\pm 0.7(\text{stat})\pm 2.2(\text{syst})\pm 0.3(\text{model})]$  MeV/c<sup>2</sup> and  $\Gamma=[30.8-2.2+2.3(\text{stat})\pm 2.5(\text{syst})\pm 1.4(\text{model})]$  MeV, respectively. First observation of  $\eta_c(2S)\rightarrow\eta'\pi^+\pi^-$  with a significance of 5.5 $\sigma$  including systematic error is obtained, and the  $\eta_c(2S)$  mass is measured to be  $M=[3635.1\pm 3.7(\text{stat})\pm 2.9(\text{syst})\pm 0.4(\text{model})]$  MeV/c<sup>2</sup>. The products of the two-photon decay width and branching fraction (B) of decays to  $\eta'\pi^+\pi^-$  are determined to be  $\Gamma_{\gamma\gamma}\Gamma_{\gamma\gamma}B=[65.4\pm 2.6(\text{stat})\pm 7.8(\text{syst})]$  eV for  $\eta_c(1S)$  and  $[5.6-1.1+1.2(\text{stat})\pm 1.1(\text{syst})]$  eV for  $\eta_c(2S)$ . The cross sections for  $\gamma\gamma\rightarrow\eta'\pi^+\pi^-$  and  $\eta'(1270)$  are measured for the first time. © 2018 authors. Published by the American Physical Society.

**Belle Collaboration (2018). Search for the lepton-flavor-violating decay  $B_0\rightarrow K^*\mu^\pm e$  SEARCH for the LEPTON-FLAVOR-VIOLATING DECAY ... S. SANDILYA et al. *Physical Review D*, 98(7).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056196699&doi=10.1103%2fPhysRevD.98.071101&partnerID=40&md5=b58afe4dfceb3bd0b703ba2b5f334d3d>

We have searched for the lepton-flavor-violating decay  $B_0\rightarrow K^*\mu^\pm e$  using a data sample of 711 fb<sup>-1</sup> that contains 772×10<sup>6</sup>  $B\bar{B}$  pairs. The data were collected near the  $\Upsilon(4S)$  resonance with the Belle detector at the KEKB asymmetric-energy e<sup>+</sup>e<sup>-</sup> collider. No signals were observed, and we set 90% confidence level upper limits on the branching fractions of  $B(B_0\rightarrow K^*\mu^+e^-)<1.2\times 10^{-7}$ ,  $B(B_0\rightarrow K^*\mu^-e^+)<1.6\times 10^{-7}$ , and, for both decays combined,  $B(B_0\rightarrow K^*\mu^\pm e)<1.8\times 10^{-7}$ . These are the most stringent limits on these decays to date. © 2018 authors. Published by the American Physical Society.

**CDF Collaboration (2018). Search for standard-model Z and Higgs bosons decaying into a bottom-antibottom quark pair in proton-antiproton collisions at 1.96 TeV SEARCH for STANDARD-MODEL Z and HIGGS ... T. AALTONEN et al. *Physical Review D*, 98(7).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056190367&doi=10.1103%2fPhysRevD.98.072002&partnerID=40&md5=32453a2c3a1fd0ea5d0a9fa2d3e9bdd1>

The Collider Detector at Fermilab collected a unique sample of jets originating from bottom-quark fragmentation (b-jets) by selecting online proton-antiproton ( $p\bar{p}$ ) collisions with a vertex displaced from the  $p\bar{p}$  interaction point, consistent with the decay of a bottom-quark hadron. This data set, collected at a center-of-mass energy of 1.96 TeV, and corresponding to an integrated luminosity of 5.4 fb<sup>-1</sup>, is used to measure the Z-boson production cross section times branching ratio into  $b\bar{b}$ . The number of  $Z\rightarrow b\bar{b}$  events is determined by fitting the dijet-mass distribution, while constraining the dominant b-jet background, originating from QCD multijet events, with data. The result,  $\sigma(p\bar{p}\rightarrow Z)\times B(Z\rightarrow b\bar{b})=1.11\pm 0.08(\text{stat})\pm 0.14(\text{syst})$  nb, is the most precise measurement of this process, and is consistent with the standard-model prediction. The data set is also used to



search for Higgs-boson production. No significant signal is expected in our data and the first upper limit on the cross section for the inclusive  $p\bar{p} \rightarrow H \rightarrow b\bar{b}$  process at  $s=1.96$  TeV is set, corresponding to 33 times the expected standard-model cross section, or  $\sigma=40.6$  pb, at the 95% confidence level. © 2018 authors. Published by the American Physical Society.

**Coughenour, B. M., Cackett, E. M., Miller, J. M., & Ludlam, R. M. (2018). A NuSTAR Observation of the Low-mass X-Ray Binary GX 349+2 throughout the Z-track. *Astrophysical Journal*, 867(1).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056096296&doi=10.3847%2f1538-4357%2faae098&partnerID=40&md5=e530f2ed137efd84526bc4c9c51fa705>

Although the most luminous class of neutron star (NS) low-mass X-ray binaries, known as Z sources, have been well studied, their behavior is not fully understood. In particular, what causes these sources to trace out the characteristic Z-shaped pattern on color-color or hardness-intensity diagrams (HIDs) is not well known. By studying the physical properties of the different spectral states of these sources, we may better understand such variability. With that goal in mind, we present a recent NuSTAR observation of the Z source GX 349+2, which spans approximately 2 days and covers all its spectral states. By creating an HID we were able to extract five spectra and trace the change in spectral parameters throughout the Z-track. GX 349+2 shows a strong, broad Fe  $K\alpha$  line in all states, regardless of the continuum model used. Through modeling of the reflection spectrum and Fe  $K\alpha$  line we find that in most states the inner disk radius is consistent with remaining unchanged at an average radius of 17.5 R<sub>g</sub> or 36.4 km for a canonical 1.4 M<sub>o</sub> NS. During the brightest flaring branch, however, the inner disk radius from reflection is not well constrained. © 2018. The American Astronomical Society. All rights reserved..

**The Alice collaboration (2018). Measurement of D0, D+, D\*+ and D s + production in Pb-Pb collisions at  $\sqrt{s_{NN}}=5.02$  TeV. *Journal of High Energy Physics*, 2018(10).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056140365&doi=10.1007%2fJHEP10%282018%29174&partnerID=40&md5=1b12c496e4475687e08d26f4277b9da2>

We report measurements of the production of prompt D0, D+, D\*+ and Ds + mesons in Pb–Pb collisions at the centre-of-mass energy per nucleon-nucleon pair  $s_{NN}=5.02$  TeV, in the centrality classes 0–10%, 30–50% and 60–80%. The D-meson production yields are measured at mid-rapidity ( $|y| \leq 0.5$ ) as a function of transverse momentum (pT). The pT intervals covered in central collisions are: 1 < pT < 50 GeV/c for D0, 2 < pT < 50 GeV/c for D+, 3 < pT < 50 GeV/c for D\*+, and 4 < pT < 16 GeV/c for Ds + mesons. The nuclear modification factors (RAA) for non-strange D mesons (D0, D+, D\*+) show minimum values of about 0.2 for pT = 6–10 GeV/c in the most central collisions and are compatible within uncertainties with those measured at  $s_{NN}=2.76$  TeV. For Ds + mesons, the values of RAA are larger than those of non-strange D mesons, but compatible within uncertainties. In central collisions the average RAA of non-strange D mesons is compatible with that of charged particles for pT > 8 GeV/c, while it is larger at lower pT. The nuclear modification factors for strange and non-strange D mesons are also compared to theoretical models with different implementations of in-medium energy loss. [Figure not available: see fulltext.] © 2018, The Author(s).

**The Alice collaboration (2018). Transverse momentum spectra and nuclear modification factors of charged particles in pp, p-Pb and Pb-Pb collisions at the LHC. *Journal of High Energy Physics*, 2018(11).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056258196&doi=10.1007%2fJHEP11%282018%29013&partnerID=40&md5=03325e833c8c8864c6318cd5f9e8>

[0e20](#)

We report the measured transverse momentum ( $p_T$ ) spectra of primary charged particles from pp, p-Pb and Pb-Pb collisions at a center-of-mass energy  $\sqrt{s_{NN}}=5.02$  TeV in the kinematic range of  $0.15 < p_T < 50$  GeV/c and  $|\eta| < 0.8$ . A significant improvement of systematic uncertainties motivated the reanalysis of data in pp and Pb-Pb collisions at  $\sqrt{s_{NN}}=2.76$  TeV, as well as in p-Pb collisions at  $\sqrt{s_{NN}}=5.02$  TeV, which is also presented. Spectra from Pb-Pb collisions are presented in nine centrality intervals and are compared to a reference spectrum from pp collisions scaled by the number of binary nucleon-nucleon collisions. For central collisions, the  $p_T$  spectra are suppressed by more than a factor of 7 around 6–7 GeV/c with a significant reduction in suppression towards higher momenta up to 30 GeV/c. The nuclear modification factor  $R_{pPb}$ , constructed from the pp and p-Pb spectra measured at the same collision energy, is consistent with unity above 8 GeV/c. While the spectra in both pp and Pb-Pb collisions are substantially harder at  $\sqrt{s_{NN}}=5.02$  TeV compared to 2.76 TeV, the nuclear modification factors show no significant collision energy dependence. The obtained results should provide further constraints on the parton energy loss calculations to determine the transport properties of the hot and dense QCD matter. [Figure not available: see fulltext.]. © 2018, The Author(s).

**The CMS collaboration (2018). Measurement of differential cross sections for Z boson production in association with jets in proton-proton collisions at  $\sqrt{s}=13$ TeV. *European Physical Journal C*, 78(11).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056995413&doi=10.1140%2fepjc%2fs10052-018-6373-0&partnerID=40&md5=495786f9f2d0518c782dc9d0224a105d>

The production of a Z boson, decaying to two charged leptons, in association with jets in proton-proton collisions at a centre-of-mass energy of 13TeV is measured. Data recorded with the CMS detector at the LHC are used that correspond to an integrated luminosity of  $2.19\text{fb}^{-1}$ . The cross section is measured as a function of the jet multiplicity and its dependence on the transverse momentum of the Z boson, the jet kinematic variables (transverse momentum and rapidity), the scalar sum of the jet momenta, which quantifies the hadronic activity, and the balance in transverse momentum between the reconstructed jet recoil and the Z boson. The measurements are compared with predictions from four different calculations. The first two merge matrix elements with different parton multiplicities in the final state and parton showering, one of which includes one-loop corrections. The third is a fixed-order calculation with next-to-next-to-leading order accuracy for the process with a Z boson and one parton in the final state. The fourth combines the fully differential next-to-next-to-leading order calculation of the process with no parton in the final state with next-to-next-to-leading logarithm resummation and parton showering. © 2018, CERN for the benefit of the CMS collaboration.

**The CMS collaboration (2018). Measurement of the associated production of a single top quark and a Z boson in pp collisions at  $\sqrt{s}=13$ TeV. *Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics*, 779, 358-384.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055893617&doi=10.1016%2fj.physletb.2018.02.025&partnerID=40&md5=4e9d0ac936c32d08ca12c01e80fa8527>

A measurement is presented of the associated production of a single top quark and a Z boson. The study uses data from proton-proton collisions at  $\sqrt{s}=13$ TeV recorded by the CMS experiment, corresponding to an integrated luminosity of  $35.9\text{fb}^{-1}$ . Using final states with three leptons (electrons or muons), the  $tZq$  production cross section is measured to be  $\sigma(pp \rightarrow tZq \rightarrow Wb\ell + \ell - q) = 123 - 31 + 33(\text{stat}) - 23 + 29(\text{syst})\text{fb}$ , where  $\ell$  stands for electrons, muons, or  $\tau$  leptons, with observed and expected significances of 3.7 and 3.1 standard deviations, respectively. © 2018 The Author

**The CMS collaboration (2018). Measurement of the groomed jet mass in PbPb and pp collisions at  $\sqrt{s_{NN}}=5.02$  TeV. *Journal of High Energy Physics*, 2018(10).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056121335&doi=10.1007%2fJHEP10%282018%29161&partnerID=40&md5=0f74240bc1a3c2940a118f89bc68aee7>

A measurement of the groomed jet mass in PbPb and pp collisions at a nucleon-nucleon center-of-mass energy of 5.02 TeV with the CMS detector at the LHC is presented. Jet grooming is a recursive procedure which sequentially removes soft constituents of a jet until a pair of hard subjects is found. The resulting groomed jets can be used to study modifications to the parton shower evolution in the presence of the hot and dense medium created in heavy ion collisions. Predictions of groomed jet properties from the pythia and herwig++ event generators agree with the measurements in pp collisions. When comparing the results from the most central PbPb collisions to pp data, a hint of an increase of jets with large jet mass is observed, which could originate from additional medium-induced radiation at a large angle from the jet axis. However, no modification of the groomed mass of the core of the jet is observed for all PbPb centrality classes. The PbPb results are also compared to predictions from the jewel and q-pythia event generators, which predict a large modification of the groomed mass not observed in the data.[Figure not available: see fulltext.] © 2018, The Author(s).

**The CMS collaboration (2018). Measurement of the top quark mass with lepton+jets final states using p p collisions at  $\sqrt{s}=13$ TeV. *European Physical Journal C*, 78(11).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056078948&doi=10.1140%2fepjc%2fs10052-018-6332-9&partnerID=40&md5=db7a672aa84c336f0ce4b53073422867>

The mass of the top quark is measured using a sample of  $t\bar{t}$  events collected by the CMS detector using proton-proton collisions at  $\sqrt{s}=13$ TeV at the CERN LHC. Events are selected with one isolated muon or electron and at least four jets from data corresponding to an integrated luminosity of 35.9fb<sup>-1</sup>. For each event the mass is reconstructed from a kinematic fit of the decay products to a  $t\bar{t}$  hypothesis. Using the ideogram method, the top quark mass is determined simultaneously with an overall jet energy scale factor (JSF), constrained by the mass of the W boson in  $q\bar{q}'$  decays. The measurement is calibrated on samples simulated at next-to-leading order matched to a leading-order parton shower. The top quark mass is found to be  $172.25\pm 0.08(\text{stat}+\text{JSF})\pm 0.62(\text{syst})\text{GeV}$ . The dependence of this result on the kinematic properties of the event is studied and compared to predictions of different models of  $t\bar{t}$  production, and no indications of a bias in the measurements are observed. © 2018, CERN for the benefit of the CMS collaboration.

**The CMS collaboration (2018). Measurements of the differential jet cross section as a function of the jet mass in dijet events from proton-proton collisions at  $\sqrt{s}=13$  TeV. *Journal of High Energy Physics*, 2018(11).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057062010&doi=10.1007%2fJHEP11%282018%29113&partnerID=40&md5=7076f1c1c0dd3e9666a3181ceebede80>

Measurements of the differential jet cross section are presented as a function of the jet mass in dijet events, in bins of jet transverse momentum, with and without a jet grooming algorithm. The data have been recorded by the CMS Collaboration in proton-proton collisions at the LHC at a center-of-mass energy of 13 TeV and correspond to an integrated luminosity of 2.3 fb<sup>-1</sup>. The absolute cross sections show slightly different jet transverse momentum spectra in data and Monte Carlo event generators for the settings used. Removing this

transverse momentum dependence, the normalized cross section for ungroomed jets is consistent with the prediction from Monte Carlo event generators for masses below 30% of the transverse momentum. The normalized cross section for groomed jets is measured with higher precision than the ungroomed cross section. Semi-analytical calculations of the jet mass beyond leading logarithmic accuracy are compared to data, as well as predictions at leading order and next-to-leading order, which include parton showering and hadronization. Overall, in the normalized cross section, the theoretical predictions agree with the measured cross sections within the uncertainties for masses from 10 to 30% of the jet transverse momentum. [Figure not available: see fulltext.]. © 2018, The Author(s).

**The CMS collaboration (2018). Performance of reconstruction and identification of  $\tau$  leptons decaying to hadrons and  $\nu\tau$  in pp collisions at  $s=13$  TeV. *Journal of Instrumentation*, 13(10).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056117966&doi=10.1088%2f1748-0221%2f13%2f10%2fp10005&partnerID=40&md5=efed7d75e0ba3b71e23892de135fee2c>

The algorithm developed by the CMS Collaboration to reconstruct and identify  $\tau$  leptons produced in proton-proton collisions at  $s=7$  and 8 TeV, via their decays to hadrons and a neutrino, has been significantly improved. The changes include a revised reconstruction of  $\pi^0$  candidates, and improvements in multivariate discriminants to separate  $\tau$  leptons from jets and electrons. The algorithm is extended to reconstruct  $\tau$  leptons in highly Lorentz-boosted pair production, and in the high-level trigger. The performance of the algorithm is studied using proton-proton collisions recorded during 2016 at  $s=13$  TeV, corresponding to an integrated luminosity of 35.9 fb<sup>-1</sup>. The performance is evaluated in terms of the efficiency for a genuine  $\tau$  lepton to pass the identification criteria and of the probabilities for jets, electrons, and muons to be misidentified as  $\tau$  leptons. The results are found to be very close to those expected from Monte Carlo simulation. © 2018 CERN for the benefit of the CMS collaboration..

**The CMS collaboration (2018). Precision measurement of the structure of the CMS inner tracking system using nuclear interactions. *Journal of Instrumentation*, 13(10).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056089778&doi=10.1088%2f1748-0221%2f13%2f10%2fp10034&partnerID=40&md5=fdfb2eb43ce5f7196a79653287d5d6dc>

The structure of the CMS inner tracking system has been studied using nuclear interactions of hadrons striking its material. Data from proton-proton collisions at a center-of-mass energy of 13 TeV recorded in 2015 at the LHC are used to reconstruct millions of secondary vertices from these nuclear interactions. Precise positions of the beam pipe and the inner tracking system elements, such as the pixel detector support tube, and barrel pixel detector inner shield and support rails, are determined using these vertices. These measurements are important for detector simulations, detector upgrades, and to identify any changes in the positions of inactive elements. © 2018 CERN for the benefit of the CMS collaboration.

**The CMS collaboration (2018). Search for a charged Higgs boson decaying to charm and bottom quarks in proton-proton collisions at  $\sqrt{s}=8$  TeV. *Journal of High Energy Physics*, 2018(11).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057130234&doi=10.1007%2fJHEP11%282018%29115&partnerID=40&md5=d825e7428fd9038cba44ba64693e475e>

A search for charged Higgs boson decaying to a charm and a bottom quark ( $H \rightarrow c b \bar{\nu}$ ) is performed using 19.7

$\text{fb}^{-1}$  of pp collision data at  $\sqrt{s}=8$  TeV. The production mechanism investigated in this search is  $t\bar{t}$  pair production in which one top quark decays to a charged Higgs boson and a bottom quark and the other decays to a charged lepton, a neutrino, and a bottom quark. Charged Higgs boson decays to  $c\bar{b}$  are searched for, resulting in a final state containing at least four jets, a charged lepton (muon or electron), and missing transverse momentum. A kinematic fit is performed to identify the pair of jets least likely to be the bottom quarks originating from direct top quark decays and the invariant mass of this pair is used as the final observable in the search. No evidence for the presence of a charged Higgs boson is observed and upper limits at 95% confidence level of 0.8–0.5% are set on the branching fraction  $\mathcal{B}(t \rightarrow H+b)$ , assuming  $\mathcal{B}(H^+ \rightarrow c\bar{b}) = 1.0$  and  $\mathcal{B}(t \rightarrow H+b) + \mathcal{B}(t \rightarrow Wb) = 1.0$ , for the charged Higgs boson mass range 90–150 GeV. [Figure not available: see fulltext.]. © 2018, The Author(s).

**The CMS collaboration (2018). Search for black holes and sphalerons in high-multiplicity final states in proton-proton collisions at  $\sqrt{s}=13$  TeV. *Journal of High Energy Physics*, 2018(11).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056647097&doi=10.1007%2fJHEP11%282018%29042&partnerID=40&md5=bf3c54611c4931b4ebc0bf971a3b7f5e>

A search in energetic, high-multiplicity final states for evidence of physics beyond the standard model, such as black holes, string balls, and electroweak sphalerons, is presented. The data sample corresponds to an integrated luminosity of  $35.9 \text{ fb}^{-1}$  collected with the CMS experiment at the LHC in proton-proton collisions at a center-of-mass energy of 13 TeV in 2016. Standard model backgrounds, dominated by multijet production, are determined from control regions in data without any reliance on simulation. No evidence for excesses above the predicted background is observed. Model-independent 95% confidence level upper limits on the cross section of beyond the standard model signals in these final states are set and further interpreted in terms of limits on semiclassical black hole, string ball, and sphaleron production. In the context of models with large extra dimensions, semiclassical black holes with minimum masses as high as 10.1 TeV and string balls with masses as high as 9.5 TeV are excluded by this search. Results of the first dedicated search for electroweak sphalerons are presented. An upper limit of 0.021 is set at 95% confidence level on the fraction of all quark-quark interactions above the nominal threshold energy of 9 TeV resulting in the sphaleron transition. [Figure not available: see fulltext.]. © 2018, The Author(s).

**The CMS collaboration (2018). Search for the decay of a Higgs boson in the  $\ell\ell\gamma$  channel in proton-proton collisions at  $\sqrt{s}=13$  TeV. *Journal of High Energy Physics*, 2018(11).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057479730&doi=10.1007%2fJHEP11%282018%29152&partnerID=40&md5=03dcef3dcbe43c0936c03a03b8bbce46>

A search for a Higgs boson decaying into a pair of electrons or muons and a photon is described. Higgs boson decays to a Z boson and a photon ( $H \rightarrow Z\gamma \rightarrow \ell\ell\gamma$ ,  $\ell = e$  or  $\mu$ ), or to two photons, one of which has an internal conversion into a muon pair ( $H \rightarrow \gamma^*\gamma \rightarrow \mu\mu\gamma$ ) were considered. The analysis is performed using a data set recorded by the CMS experiment at the LHC from proton-proton collisions at a center-of-mass energy of 13 TeV, corresponding to an integrated luminosity of  $35.9 \text{ fb}^{-1}$ . No significant excess above the background prediction has been found. Limits are set on the cross section for a standard model Higgs boson decaying to opposite-sign electron or muon pairs and a photon. The observed limits on cross section times the corresponding branching fractions vary between 1.4 and 4.0 (6.1 and 11.4) times the standard model cross section for  $H \rightarrow \gamma^*\gamma \rightarrow \mu\mu\gamma$  ( $H \rightarrow Z\gamma \rightarrow \ell\ell\gamma$ ) in the 120–130 GeV mass range of the  $\ell\ell\gamma$  system. The  $H \rightarrow \gamma^*\gamma \rightarrow \mu\mu\gamma$  and  $H \rightarrow Z\gamma \rightarrow \ell\ell\gamma$  analyses are combined for  $m_H = 125 \text{ GeV}$ , obtaining an observed (expected) 95% confidence level upper limit of 3.9 (2.0) times the standard model cross section. [Figure not available: see fulltext.]. © 2018, The Author(s).

**The CMS collaboration (2018). Searches for pair production of charginos and top squarks in final states with two oppositely charged leptons in proton-proton collisions at  $\sqrt{s}=13$  TeV. *Journal of High Energy Physics*, 2018(11). <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056909440&doi=10.1007%2fJHEP11%282018%29079&partnerID=40&md5=45a05f8871459ca2a797087c325d971e>**

A search for pair production of supersymmetric particles in events with two oppositely charged leptons (electrons or muons) and missing transverse momentum is reported. The data sample corresponds to an integrated luminosity of 35.9 fb<sup>-1</sup> of proton-proton collisions at  $\sqrt{s}=13$  TeV collected with the CMS detector during the 2016 data taking period at the LHC. No significant deviation is observed from the predicted standard model background. The results are interpreted in terms of several simplified models for chargino and top squark pair production, assuming R-parity conservation and with the neutralino as the lightest supersymmetric particle. When the chargino is assumed to undergo a cascade decay through sleptons, with a slepton mass equal to the average of the chargino and neutralino masses, exclusion limits at 95% confidence level are set on the masses of the chargino and neutralino up to 800 and 320 GeV, respectively. For top squark pair production, the search focuses on models with a small mass difference between the top squark and the lightest neutralino. When the top squark decays into an off-shell top quark and a neutralino, the limits extend up to 420 and 360 GeV for the top squark and neutralino masses, respectively. [Figure not available: see fulltext.]. © 2018, The Author(s).

**The CMS collaboration (2018). Studies of  $B_s^{*0}$  and  $B_s^0$  mesons including the observation of the  $B_s^{*0} \rightarrow B_0 K_S^0$  decay in proton-proton collisions at  $\sqrt{s}=8$  TeV. *European Physical Journal C*, 78(11). <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056580621&doi=10.1140%2fepjc%2fs10052-018-6390-z&partnerID=40&md5=ba6a3e0c35bf21337a3f77cdd3d8cb7a>**

Measurements of  $B_s^{*0}$  and  $B_s^0$  mesons are performed using a data sample of proton-proton collisions corresponding to an integrated luminosity of [InlineEquation not available: see fulltext.], collected with the CMS detector at the LHC at a centre-of-mass energy of 8 TeV. The analysis studies P-wave  $B_s^0$  meson decays into  $B^+ K^-$  and  $B^0 K_S^0$ , where the  $B^+$  and  $B^0$  mesons are identified using the decays  $B^+ \rightarrow J/\psi K^+$  and  $B^0 \rightarrow J/\psi K^*(892)^0$ . The masses of the P-wave  $B_s^0$  meson states are measured and the natural width of the  $B_s^{*0}$  state is determined. The first measurement of the mass difference between the charged and neutral  $B^*$  mesons is also presented. The  $B_s^{*0} \rightarrow B_0 K_S^0$  decay is observed, together with a measurement of its branching fraction relative to the  $B_s^{*0} \rightarrow B^+ K^-$  decay. © 2018, CERN for the benefit of the CMS collaboration.

## PSYCHOLOGY

**Barbosa, M., Beeghly, M., Moreira, J., Tronick, E., & Fuertes, M. (2018). Robust Stability and Physiological Correlates of Infants' Patterns of Regulatory Behavior in the Still-Face Paradigm at 3 and 9 Months. *Developmental Psychology*, (article in press). <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054035245&doi=10.1037%2fdev0000616&partnerID=40&md5=b422acf967ce5df9c7046ac477cea7a0>**

This study examined the stability of three patterns of infant regulatory behavior identified in the face-to-face still-face (FFSF) paradigm at 3 and 9 months-social-positive oriented, distressed/inconsolable, and self-comfort

oriented-and whether variations in infants' heart-rate were correlated with them. Although some studies have examined the stability of discrete infant behaviors, none have investigated the stability of early regulatory patterns across FFSF episodes over time. Healthy full-term infants and their mothers (N = 112) were videotaped in the FFSF when infants were 3 and 9 months old. Infants' regulatory patterns were scored with the Coding System for Regulatory Patterns in the FFSF. Infants' heart-rate level during each episode of the FFSF was also assessed. The social-positive-oriented pattern was the most prevalent at both ages. Cross-tabulation analysis showed a robust stability (Cohen's  $\kappa = .72$ ) of the regulatory patterns from 3 to 9 months. The heart-rate level of infants with a social-positive-oriented pattern at 3 and 9 months showed recovery to baseline levels following the still-face. In contrast, the heart-rate level of infants with a distressed-inconsolable pattern at 9 months increased from the still-face to the reunion episode, whereas the heart-rate level of infants with a self-comfort-oriented pattern at 9 months did not change from the still-face to the reunion episodes. These results suggest that infants exhibit distinct organized regulatory patterns as early as 3 months that are stable over a 6-month interval and associated with variations in infants' physiological responses across FFSF episodes at both ages. © 2018 American Psychological Association.

**Kopetz, C., Woerner, J. I., MacPherson, L., Lejuez, C. W., Nelson, C. A., Zeanah, C. H., & Fox, N. A. (2018). Early Psychosocial Deprivation and Adolescent Risk-Taking: The Role of Motivation and Executive Control. *Journal of Experimental Psychology: General*, (article in press).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053279463&doi=10.1037%2fxge0000486&partnerID=40&md5=af0566d0c88f6aa49abf3d1594d3eef0>

Risk-taking in adolescence has been often associated with early life adversities. However, the impact of such macrolevel factors on risk behavior has been rarely studied in humans. To address these gaps we recruited a sample of young adolescents who were part of a randomized control trial of foster care. Children institutionalized at or soon after birth were randomly assigned either to be removed from institutions and placed into a family or foster care intervention or to remain in institutions receiving care as usual. These children were subsequently followed up through 12 years of age and compared with a sample of children who had never been institutionalized. Using this sample, we examined the impact of early childhood deprivation on risk-taking behavior and explored the role of motivation (i.e., sensation seeking) and executive control (i.e., planning). Early psychosocial deprivation decreased engagement in risk-taking among young adolescents by reducing sensation seeking, a motivation often associated with risk-taking in adolescence. The impact of early psychosocial deprivation on sensation seeking and consequently on engagement in risk-taking was further reduced by its deleterious effects on executive control. These findings challenge the traditional view according to which risk behavior is a maladaptive response to adversities and suggest that it may represent adolescents' attempts to fulfill important motivations. © 2018 American Psychological Association.

**Parker, H. A., Rapport, L. J., Williams, M. W., Hanks, R. A., Lumley, M. A., & Bogg, T. (2018). Functional Independence After Acquired Brain Injury: Prospective Effects of Health Self-Efficacy and Cognitive Impairment. *Rehabilitation Psychology*, (article in press).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053691468&doi=10.1037%2frep0000243&partnerID=40&md5=ed16ed77ab05194a2405bec0d4605226>

Objective: To examine how health self-efficacy and cognitive impairment severity relate to functional independence after acquired brain injury (ABI). Design: Observational. Setting: Outpatient rehabilitation

hospital. Participants: Seventy-five adults with predominately stroke or traumatic brain injury who were beginning a course of occupational therapy. Main Measures: Health self-efficacy was assessed with the Self-Rated Abilities for Health Practices. Cognitive functioning was assessed via a composite z score of neuropsychological tests. Trait affectivity was assessed with the Positive and Negative Affect Schedule. Functional independence was assessed with the Barthel Index and Lawton Instrumental Activities of Daily Living Scale. Results: Health self-efficacy correlated moderately with functional independence. A moderation threshold effect was detected that revealed for whom health self-efficacy predicted functional independence. Among participants with normal to mildly impaired cognition ( $>2$  z cognitive composite), health self-efficacy correlated positively with functional independence, which held after accounting for trait affectivity. In contrast, health self-efficacy was not correlated with functional independence among participants with greater impairment ( $> 2$  z cognitive composite). Conclusions: Health self-efficacy predicts functional independence and may serve as a protective factor after ABI among individuals with relatively intact cognition. However, health self-efficacy does not predict functional independence among individuals with moderate or severe cognitive impairment, possibly due to limited self-awareness. This study extends the literature linking health self-efficacy with rehabilitation outcomes and reinforces the need for promoting self-management in ABI. © 2018 American Psychological Association.

**Wong, C. G., Rapport, L. J., Billings, B. A., Ramachandran, V., & Stach, B. A. (2018). Hearing Loss and Verbal Memory Assessment Among Older Adults. *Neuropsychology*, (article in press).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053083736&doi=10.1037%2fneu0000489&partnerID=40&md5=5f352fe8bb19baca387446282d70e1b4>

Objective: Research has found that adults with hearing loss perform worse on cognitive testing than adults without hearing loss; however, heavy emphasis on tests involving auditory stimuli may overdiagnose cognitive impairment among individuals with hearing loss. This study compared visual- and auditory-verbal memory tests among adults with and without hearing loss. Method: Forty-one adults with hearing loss (HL) and 41 age-matched adults with normal hearing (NH) completed a neuropsychological battery that included auditory and visual versions of the Hopkins Verbal Learning Testing-Revised (HVLT-R). A natural auditory condition presented HVLT-R stimuli at normal speaking volume. A crossed auditory condition presented HVLT-R stimuli to individuals with hearing loss with amplified acoustic intensity and to individuals with normal hearing under hearing loss simulation. Results: Mixed-model ANOVA indicated significant group (HL vs. NH) by condition (visual, natural auditory, crossed auditory) interactions for HVLT-R performance, with large effect sizes. The HL group performed significantly worse than the NH group on the natural auditory version; however, the NH group performed significantly worse than the HL group on the crossed condition. The groups were equivalent on the visual condition and all other cognitive tests, showing small effect sizes. Moreover, for the HL group, visual HVLT-R correlated with other cognitive tests whereas auditory versions did not. Conclusion: Cognitively intact older adults with hearing loss appeared impaired on auditory-verbal memory assessment under typical administration conditions. Visual assessment of verbal memory showed evidence of superior validity and is a viable alternative method to assess memory function especially in older populations. © 2018 American Psychological Association.

**Brown, S. G., Tenbrink, A. P., & LaMarre, G. (2019). Performance while distracted: The effect of cognitive styles and working memory. *Personality and Individual Differences*, 138, 380-384.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0->



[85055737863&doi=10.1016%2fj.paid.2018.10.025&partnerID=40&md5=6ffe0ed0ba83204588697b7c83fcdc4c](https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055737863&doi=10.1016%2fj.paid.2018.10.025&partnerID=40&md5=6ffe0ed0ba83204588697b7c83fcdc4c)

Distractions are more prevalent than in the past. Several off-task factors and activities (e.g., e-mails, social media) can distract from important tasks, resulting in losses to productivity. It is therefore important to understand factors, such as individual differences, associated to distraction-related performance decrements. In this study, we examine the effects of cognitive styles (i.e., creating and planning) and working memory on task accuracy, in a distracting context. Undergraduate students participated in a lab study where they completed a Microsoft Excel task under conditions of distraction, the cognitive styles indicator (CoSI), the operation span (O-Span) task, and the Wonderlic Personnel Test (WPT-R). Controlling for general mental ability (GMA), we found a direct effect of creating on task accuracy. However, we observed no significant moderating effects of working memory on the effects of creating and planning on task accuracy. Our results highlight the value of further research on cognitive styles, within the context of distracting work. © 2018 Elsevier Ltd

**Helmers, B. R., Jacques-Tiura, A. J., & Abbey, A. (2019). Associations between young adult men's patterns of alcohol use and sexual behavior: A latent profile analysis of two independent samples. *Addictive Behaviors*, 90, 20-26. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055132936&doi=10.1016%2fj.addbeh.2018.10.005&partnerID=40&md5=fdfe8d3570574d8bb5ba83464747ea95>**

Men's alcohol consumption and casual sexual behavior peak in early adulthood. Although there is a strong positive association between these behaviors, most studies have utilized a between-subjects approach rather than a person-centered approach to assess this relationship. A person-centered approach allows for an examination of subgroups of drinkers that may differ in their casual sexual behaviors. To address this gap, secondary data analyses were conducted with two independent samples totaling 906 men between the ages of 18 and 29 from the Midwestern United States. In both studies, participants reported their alcohol expectancies and consumption, sexual behaviors, and sexual attitudes. Multiple group latent profile similarity analyses were conducted using the alcohol-related variables. Four similar profiles emerged in both samples; thus, the data were combined. Casual sex-related variables were then examined in relation to the profiles. The two lighter drinking groups differed from one another in their alcohol consumption and sexual attitudes; however, they did not differ in their alcohol expectancies or number of sex partners. The two heavier drinking groups differed from one another in their liquid courage expectancies, alcohol consumption, one-time-only partners, and sexual attitudes; however, they did not differ from each other in their sex-drive expectancies or lifetime partners. Person-centered approaches can be used to develop more tailored interventions, particularly for those at greater risk for the negative health consequences of engaging in sexual behavior with multiple one-time-only partners. © 2018 Elsevier Ltd

**Kentner, A. C., Cryan, J. F., & Brummelte, S. (2018). Resilience priming: Translational models for understanding resiliency and adaptation to early life adversity. *Developmental Psychobiology*. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054747965&doi=10.1002%2fdev.21775&partnerID=40&md5=de81764e264e39277e508e58487bae49>**

Despite the increasing attention to early life adversity and its long-term consequences on health, behavior, and the etiology of neurodevelopmental disorders, our understanding of the adaptations and interventions that promote resiliency and rescue against such insults are underexplored. Specifically, investigations of the perinatal period often focus on negative events/outcomes. In contrast, positive experiences (i.e. enrichment/parental care//healthy nutrition) favorably influence development of the nervous and endocrine systems. Moreover, some stressors result in adaptations and demonstrations of later-life resiliency. This review explores the

underlying mechanisms of neuroplasticity that follow some of these early life experiences and translates them into ideas for interventions in pediatric settings. The emerging role of the gut microbiome in mediating stress susceptibility is also discussed. Since many negative outcomes of early experiences are known, it is time to identify mechanisms and mediators that promote resiliency against them. These range from enrichment, quality parental care, dietary interventions and those that target the gut microbiota. © 2018 Wiley Periodicals, Inc.

**Mooney-Leber, S. M., Spielmann, S. S., & Brummelte, S. (2018). Repetitive neonatal pain and reduced maternal care alter brain neurochemistry. *Developmental Psychobiology*.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054549087&doi=10.1002%2fdev.21777&partnerID=40&md5=9710fca6bc7c9145179cb309b6485240>

Preterm infants are exposed to many stressors while in the neonatal intensive care unit including pain and reduced maternal care. Both stressors can have a profound negative impact on brain development, and the present study sought to investigate some of the biological mechanisms underlying this phenomenon. Rat pups underwent a series of repetitive needle pokes and/or reduced maternal care through a novel tea-ball infuser encapsulation model during the first four days of life. On postnatal day four, pups were sacrificed and serum was analyzed for corticosterone, while brains were tested for various neurotransmitters and brain metabolites through magnetic resonance spectroscopy. We found that exposure to maternal isolation and neonatal pain produced an increase in serum corticosterone but decreased glutamate levels in the hippocampus and frontal cortex. These alterations in stress responding and neurochemistry in response to the early-life stressors may help explain some of the negative outcomes seen in preterm infants. © 2018 Wiley Periodicals, Inc.

**Pegram, S. E., Abbey, A., Woerner, J., & Helmers, B. R. (2018). Partner type matters: Differences in cross-sectional predictors of men's sexual aggression in casual and steady relationships. *Violence and Victims*, 33(5), 902-917.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055129729&doi=10.1891%2f0886-6708.VV-D-17-00080&partnerID=40&md5=1ac9cc421f01f61131ab04b74f991352>

Researchers rarely consider if different theoretical models are needed to understand the etiology of men's sexual aggression against women in steady as compared to casual relationships. A modified confluence model was evaluated with survey data from 556 young, single men. Hostile masculinity was the only assessed risk factor that had a direct relationship to sexual aggression against steady and casual partners. Impersonal sex and friends' approval of forced sex were directly related to sexual aggression against casual partners; whereas, heavy alcohol consumption was directly related to sexual aggression against steady partners. Psychopathy-related personality traits were indirectly related to both types of sexual aggression. The model explained a moderate amount of variance in casual date perpetration, but only a small amount of variance in steady date perpetration. Thus, more research and theory is needed to understand violence in this type of relationship. © 2018 Springer Publishing Company.

**Spielmann, S. S., Joel, S., & Impett, E. A. (2018). Pursuing Sex with an Ex: Does It Hinder Breakup Recovery? *Archives of Sexual Behavior*.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055496114&doi=10.1007%2fs10508-018-1268-6&partnerID=40&md5=63a83da91b785ddb34fef1b5b921b0cf>

The present research used longitudinal methods to test whether pursuing sex with an ex-partner hinders breakup recovery. Participants completed a month-long daily diary immediately following a breakup, as well as a two-month follow-up (Study 1). Daily analyses revealed positive associations between trying to have sex with an

ex-partner and emotional attachment to the ex-partner, but not other aspects of breakup recovery, such as distress, intrusive thoughts, or negative affect. Longitudinal changes from day to day, and over 2 months, revealed that pursuing sex with an ex was not a predictor of breakup recovery over time. To address the limitation that Study 1 only assessed attempted sexual pursuits, Study 2 explored associations between pursuit of, and actual engagement in, sexual activities with ex-partners. Results revealed that most sexual pursuits were successful, and success rates were not associated with breakup recovery. Findings challenge common beliefs about potential harm of pursuing sex with an ex. © 2018, Springer Science+Business Media, LLC, part of Springer Nature.

**Bogg, T., Marshbanks, M. R., Doherty, H. K., & Vo, P. T. (2019). Testing a brief motivational-interviewing educational commitment module for at-risk college drinkers: A randomized trial. *Addictive Behaviors, 90*, 151-157. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055906988&doi=10.1016%2fj.addbeh.2018.10.028&partnerID=40&md5=54ede6aa93222e40f8219fa7c951afa0>**

Background: The goal of the present study was to test the drink and harm reduction effects of a novel educational commitment (EC) module as a complement to a standard brief MI protocol (i.e., the Brief Alcohol Screening and Intervention for College Students; BASICS, Dimeff, Baer, Kivlahan, & Marlatt, 1999). Methods: Using a randomized trial design, 180 university students were assigned to one of three conditions: Information, BASICS, or BASICS+EC. Participants completed an alcohol consumption interview and measures of alcohol-related problems, partying decision-making, subjective student role investment, and self-control-related traits at baseline and at two- and nine-month follow-ups. Results: Linear models showed significant condition effects for two-month and nine-month drink quantity, but not for alcohol problems/consequences. Secondary outcome analyses showed significant condition effects for two-month high-risk high-reward partying decision-making and nine-month conscientiousness. Somewhat larger-sized decreases in consumption were observed at two months for the BASICS+EC condition compared to the BASICS condition, although these differences were not present at nine months. Conclusions: The differential efficacy between the BASICS and BASICS+EC conditions compared to the Information condition reinforces the utility of in-person feedback modalities as more intensive indicated prevention strategies for at-risk college drinkers. The limited differential efficacy for BASICS+EC compared to BASICS suggests a brief MI module for the academic/vocational aspects of the student role is not associated with greater long-term drink and harm reduction. Future research should examine more intensive educational commitment modalities, the utility of on-going academic goal and action feedback, and mechanisms of differential efficacy across intervention groups. © 2018 Elsevier Ltd

**Brummelte, S. (2018). Treating Maternal Depression: Considerations for the Well-Being of the Mother and Child. *Policy Insights from the Behavioral and Brain Sciences, 5*(1), 110-117. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056732784&doi=10.1177%2f2372732217740594&partnerID=40&md5=7bca038848a40ed3b096a253a0832081>**

Maternal depression is a serious mental illness that not only affects the health of the mother but also affects the fetus and child. Treatment with antidepressants (especially serotonin reuptake inhibitors [SRIs]) is common in depressed pregnant women and mothers but bears its own risk for the progeny. Due to a lack of research on the long-term consequences of each condition (i.e., untreated vs. treated depression), the question remains: whether a depressed women should take antidepressant medication during pregnancy and the postpartum. This article reviews the current state of SRI use during the perinatal period and the associated developmental effects of antidepressant medication. Furthermore, it discusses directions for improvement of future research as well as

policy implications in regard to human and animal research. Without a better comprehension of the underlying mechanism that induces developmental effects, advising pregnant women and mothers will be difficult. © The Author(s) 2018.

**Harvey, M. W., Farrell, A. K., Imami, L., Carré, J. M., & Slatcher, R. B. (2019). Maternal attachment avoidance is linked to youth diurnal cortisol slopes in children with asthma. *Attachment and Human Development, 21*(1), 23-37. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057328947&doi=10.1080%2f14616734.2018.1541514&partnerID=40&md5=174928eb884dd65b4bc0ad2196bf79eb>**

Prior evidence suggests that an individual's attachment orientation is linked to the health and health-related biology of his/her romantic relationship partners. The current study examined whether this effect extends to parent-child relationships. Specifically, we investigated the association between maternal attachment anxiety and avoidance and diurnal cortisol of offspring. In a sample of 138 youth with asthma and their primary caregivers, caregivers reported their attachment orientations, and their children (aged 10–17) supplied four saliva samples per day over four days to assess diurnal cortisol patterns. Growth curve analyses revealed no links to caregiver attachment anxiety, but caregiver attachment avoidance was significantly associated with children's diurnal cortisol slopes, such that greater attachment avoidance predicted flatter diurnal cortisol slopes. Maternal warmth did not mediate this link. These results support the possibility that an individual's adult attachment orientation may "get under the skin" of family members to influence their health-related biology. Future research should seek to determine the causal direction of this association and mechanisms of this effect. © 2018, © 2018 Informa UK Limited, trading as Taylor & Francis Group.

**Liao, J., Zhang, Y., Li, Y., Li, H., Zilioli, S., & Wu, Y. (2018). Exogenous testosterone increases decoy effect in healthy males. *Frontiers in Psychology, 9*(NOV).**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056389956&doi=10.3389%2ffpsyg.2018.02188&partnerID=40&md5=46efa367036c1b8e1ae0c9bcb01fbd4b>

There is increasing interest in the role played by testosterone in economic decision-making and social cognition. However, despite the growing body of findings in this field of research, no empirical study to date has tested whether testosterone modulates decision-making when an asymmetrically dominated decoy option is introduced in a choice set. Within a choice set that comprises two options, an asymmetrically dominated decoy option is a third option that, when introduced in the choice set, is much worse than one of the existing options, but comparable to the other existing option. Introduction of a decoy option leads to a preference toward the dominating option (i.e., decoy effect). Healthy male participants (n = 63) received a single-dose of 150 mg testosterone gel in a double-blind, placebo-controlled, between-subjects design. At 180 min post-administration, participants took part in a decision-making task to elicit decoy effect. Results showed that participants in the testosterone group made less consistent choices and more target choices (i.e., decoy effect) than participants in the placebo group. These findings are interpreted in light of the dual-process theory and are in line with existing evidence suggesting that testosterone promotes more intuitive and automatic judgments in human decision-making. © 2018 Liao, Zhang, Li, Li, Zilioli and Wu.

**Norman, A. L., Woodard, J. L., Calamari, J. E., Gross, E. Z., Pontarelli, N., Socha, J., . . . Armstrong, K. (2018). The fear of Alzheimer's disease: mediating effects of anxiety on subjective memory complaints. *Aging and Mental Health*.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057315889&doi=10.1080%2f13607863.2018.1534081&partnerID=40&md5=9eb0fb7745f1bbffa256ac641151ea96>

Objectives: To determine if the fear of developing Alzheimer's disease (FDAD) construct, in combination with similar psychoemotional factors, could help elucidate the nature of older adults' subjective memory complaints (SMCs) and subsequent objective memory performance. Methods: One hundred ninety-three healthy older adults (aged 65–93) were administered clinician and self-report measures of depression, worry, anxiety, illness attitudes, and memory, and each rated their concern with developing AD. Results: Self-reported FDAD was not associated with objective memory performance ( $p > .05$ ). FDAD, trait anxiety, general anxiety, and general and illness-related worry were independently associated with subjective memory report ( $ps < .05$ ). The relationship between FDAD and subjective memory report was mediated by measures of general trait and state anxiety, but not general worry or illness-specific worry. Conclusions: FDAD was not associated with objective memory functioning, suggesting AD concerns were not reflective of memory pathology. The mediating effect of anxiety on the relationship between FDAD and subjective memory report suggests that assessment of anxiety, beyond AD fear, may help identify older adults at risk for developing negative perceptions of memory and related distress. © 2018, © 2018 Informa UK Limited, trading as Taylor & Francis Group.

**Speer, A. B., Schwendeman, M. G., Reich, C. C., Tenbrink, A. P., & Siver, S. R. (2018). Investigating the Construct Validity of Performance Comments: Creation of the Great Eight Narrative Dictionary. *Journal of Business and Psychology*.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056322462&doi=10.1007%2fs10869-018-9599-9&partnerID=40&md5=e723f4209d169a1fa9198aa0b07856d4>

Performance narratives are qualitative text descriptions of an employee's work performance. Despite containing rich information that can be leveraged by practitioners and researchers, few efforts have systematically examined performance narratives. This study investigated whether performance narratives can automatically and reliably be scored into meaningful performance dimensions. Using the Great Eight as a conceptual framework, a custom dictionary was developed and comments were scored via automated text mining. This dictionary, labeled the Great Eight Narrative Dictionary, was then validated against a set of convergent measures to establish construct validity evidence for the derived narrative scores. Inter-rater agreement in linking word phrases to performance dimensions was high, and the derived performance dimensions had acceptable internal consistency. Narrative scores also displayed evidence of construct validity, with an expected pattern of correlations with text scores from an alternative text mining dictionary and with developmental performance ratings made using traditional numerical formats. Collectively, findings support the use of the Great Eight Narrative Dictionary to score performance narratives, and the dictionary is provided openly to facilitate future use. © 2018, Springer Science+Business Media, LLC, part of Springer Nature.

## SOCIOLOGY

**Fasenfest, D. (2018). Is Marx Still Relevant? *Critical Sociology*, 44(6), 851-855.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053623476&doi=10.1177%2f0896920518784793&partnerID=40&md5=52e73fd55213283c2bc36292dbaf8dd3>

(no abstract available)

**Montazer, S. (2018). Disentangling the effects of primary and secondary international migration on psychological distress: the role of mastery. *Canadian Journal of Public Health*, 109(3), 284-293.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053381707&doi=10.17269%2fs41997-018-0057-2&partnerID=40&md5=d0f46399a8e389f7398475db50c32d2d>

**Objectives:** This study examined the effect of mode of migration—primary immigration (direct migration from origin country) and secondary immigration (migration from a country of residence other than the origin country)—by level of economic development of country of origin on psychological distress of immigrants to Canada. The study focused on the explanatory role of mastery in the relationship between mode of migration/level of economic development of origin country and distress. Mastery is the belief that one can and does master, control, and shape one’s own life. **Methods:** Data from the Neighbourhood Effects on Health and Well-being study, which contains important measures such as the mode of migration, was used to assess the study objectives. The analytic sample included 1496 Canadian-born and 387 foreign-born (non-refugee) participants. Hierarchical linear modeling was used to address the study objectives. **Results:** Results point to a “healthy immigrant effect”—lower distress among the foreign-born than the native-born—but only among primary immigrants from less-developed countries. Secondary immigrants from less-developed countries report higher distress than the native-born and their primary-immigrant counterparts. The higher distress among secondary immigrants was due in part to lower mastery among this group. Immigrants from developed origin countries did not report different levels of distress than the native-born, irrespective of mode of migration. **Conclusion:** This study fills an important gap in the literature on immigration and mental health and reveals that the healthy immigrant effect is not generalizable to all immigrants; it is contingent on the mode of migration/level of economic development of the country of origin. © 2018, The Canadian Public Health Association.

**Gottfried, H., & Chun, J. J. (2018). Care Work in Transition: Transnational Circuits of Gender, Migration, and Care. *Critical Sociology*, 44(7-8), 997-1012.**

<http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85056715189&doi=10.1177%2f0896920518765931&partnerID=40&md5=9a5650a4599f3e009ce58252dcbe83b0>

This article presents a broad overview of the emerging field of scholarship on gender, migration and care work. The first section provides a rationale for linking the embodied intimate labor of sex workers and surrogate mothers to more traditional caregiving among nannies, nurses and eldercare aids. Through an intersectional optic on power and domination in care workers’ everyday lives, we highlight the ways in which love’s labor is lost and devalued in the sphere of the home as workplace, the family and community as employer, the state as labor recruiter, and the labor market as a site of ethnic boundaries and exclusions. Distinguishing different types of care and its institutional and geographic location matters in explaining current care in transition. Care work, in many domains, has become appropriated by markets. We consider how political, institutional, and cultural factors have shaped, and are reshaping, the ideas and norms of care in the context of transnational care worker migration. Too often, studies of gendered care migration fail to account for the differential impacts of state migration and care policies for women across class and social status within single country contexts. Care workers are beginning to challenge new forms of commodified care work. The final section explores how grassroots efforts to organize and advocate for the rights of domestic workers have evolved in countries in both the Global North and South. © The Author(s) 2018.

**Wheaton, B., & Montazer, S. (2017). Studying Stress in the Twenty-First Century: An Update of Stress Concepts and Research.** In T. L. Scheid & E. R. Wright (Eds.), *Handbook for the Study of Mental Health: Social Contexts, Theories, and Systems, 3rd Edition* (pp. 180-206). Cambridge University Press.

In this chapter, Wheaton and Montazer distinguish among commonly used terms for stress, stressors, and distress. They then examine models that have shaped our understanding of the stress concept, describing the ways in which the study of stress has evolved. The chapter begins by differentiating between two original models of stress: the biological stress model and the social engineering stress model. The authors then go on to define and differentiate different types of stress which lie within the "stress universe," and consider the distinctions between different types (and sources) of stress. Beyond these conceptual distinctions is the empirical issue of whether we need to measure diverse sources of stress. Wheaton and Montazer argue that we do - and that we need to assess the "unique" effects of diverse sources of stress (controlling for other stressors) as well as the "total" effect of stressors on mental health. This point is illustrated with data from three studies. The chapter considers recent trends in stress research. The direction of research on stress since 2000 can be summarized by three points. First, many have focused on the combined effects of more than one type of stressor. Second, research has given considerable attention to the life course as cumulative differential exposure to stressors. The third trend focuses on social context and macro-stress. Compared to the earlier work on contextual stress that examined the role of economic downturns, recent research has focused more on natural and man-made disasters and mass violence. What are the unique sources of stress that we face today (as opposed to the stressors we faced twenty years ago), and how can we measure these stressors as well as their effects?

## URBAN PLANNING

**Loh, C. G. (2019). Placemaking and implementation: Revisiting the performance principle.** *Land Use Policy, 81*, 68-75. <http://proxy.lib.wayne.edu/login?url=https://www.scopus.com/inward/record.uri?eid=2-s2.0-85055629108&doi=10.1016%2fj.landusepol.2018.10.024&partnerID=40&md5=29afa4801725d4cc9413bb82abf16639>

Using a survey of cities that participated in a statewide placemaking plan assistance program, this study contributes to the plan implementation literature in two ways. First, unlike most studies of plan implementation, this study evaluates the implementation of project plans. Second, departing from the largely conformance-based recent work on plan evaluation, the study expands the depth of our understanding of performance-based plan evaluation. The study finds that although survey respondents reported little concrete implementation progress, the plans had already been influential in changing conversations and priorities around placemaking. This study suggests that planners should expand their conceptualizations of how plans can impact communities.

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