# Louisiana Scientist

# **BULLETIN OF THE LOUISIANA ACADEMY OF SCIENCES**

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LAS\*90

Announcing our 90th annual Meeting

**23 February 2016** 

# LOUISIANA SCIENTIST

# **BULLETIN OF THE LOUISIANA ACADEMY OF SCIENCES**

#### **JOIN US FOR**

# LAS\*90

The 90th Annual Meeting of the Louisiana Academy of Sciences

Celebrating 90 Years of Scientific Excellence and Fellowship
Saturday, 12 March 2016
LSU atAlexandria

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#### A MESSAGE FROM BULLETIN EDITOR RIAD YEHYA

Greetings to all of you, young and well established scholars. I hope that 2016 will bring health, happiness and professional satisfaction to all of you.

The Louisiana Academy of Science's major event is the annual meeting. Such meetings make all of us proud: Professional papers are presented and critiqued, students with the best research works are recognized and rewarded, and the proceedings are published. But, besides this very important event, what are other educational and scientific functions that could be fulfilled by LAS and/or its members? The purpose of this message is to suggest some issues and open a discussion about how they could be addressed.

The first issue is encouraging high school students to excel in science through offering scholarships and other rewards. I suggest that each LAS division present three annual rewards to the top three students in his or her respective area or areas.

Second, the United States is a very stratified society, and higher education is stratified by gender, race/ethnicity, jobs, income and wealth. The challenge for LAS is how to make science more equitable in Louisiana. I believe that LAS should offer annual scholarships to top young female, minority, and disadvantaged students.

Third, the proportion of Louisiana scientists who participate in LAS activities and functions is low. The challenge for us is to address how to increase such participation.

Fourth, the funding of higher education was cut drastically in recent years. LAS should do its part to help educate the public about the possible consequences of reduced funding for higher education and serve as a supporting resource for those institutions of higher education by offering suggestions on how the associated problems could be addressed or dealt with.

Fifth, relatively a higher proportion of low-income students, particularly minority students, drop out of school. The challenge for us is to design and participate in a plan aiming at decreasing these proportions.

I welcome and appreciate any discussion and/or critique of the issues above, including the rejection of what was mentioned and/or addition of other issues.

I look forward to seeing you at the 90<sup>th</sup> annual meeting in Alexandria on March 12.

#### A MESSAGE FROM ACADEMY PRESIDENT JOHN P. DOUCET

It is a privilege to serve you. You and I are inheritors of an Academy born before Huey P. Long became governor, in the year of the Great Mississippi River Flood that left 700,000 Louisianans homeless, and at a time when Louisiana was defined by poverty, corruption, underdevelopment, and social injustice. Perhaps the last thing on anyone's mind at that time in this state was science.

Anyone, that is, except for the handful of visionary professors and industry leaders who met at Centenary College in 1927. And with the Academy's 90th annual meeting this year in March, we honor their legacy once again. Following the precedent they set, next month we not only share our own discoveries and progress over the past year but also engage and encourage our students as the new heirs of this long tradition. I look forward to seeing you all in Alexandria on 12 March for a Saturday of discussion and exchange.

As some of you are aware, it was 38 years ago that I was elected President of the Louisiana Junior Academy of Sciences. The junior academy (LJAS) was a loose association of high school science students and science clubs founded in 1941 and sponsored by the professional Academy (LAS) that met annually, usually in association with LAS meetings. At LJAS meetings, we hosted symposia in the disciplines, discussed junior academy policy, and, like everything else in high school, competed in a scrapbook contest. And, if you're wondering as I have done over the past year: Yes, I had visions of one day becoming a scientist and leading the LAS.

Now that I am the former, how will I fulfill the latter? To answer, I have at my reach a complete collection of our *Proceedings*. The journey of browsing and reading the discoloring pages of our history is not only daunting but also quite revealing. There in those old, small pages are reports by the most important scientists and science professors--both prominent and promising—in the state's history. The *Proceedings* held a premiere position in the careers of our scientific forebears in Louisiana, and my primary goal as President is to see it back in press.

As a matter of fact, the process of publishing the next volume of the *Proceedings* is well underway for an anticipated 2016 release. What this means for you today is that attendees at the upcoming Academy meeting, as well as members who are not attending, should consider submitting manuscripts for the subsequent future volume right now. And don't forget that the *Proceedings* is not only place to publish your students' work—it's also a place for your own.

Times have changed since our journal held its premiere place 90 years ago. There are certainly other places to publish: I recently saw an estimate of the number of journals estimated at 25,000 and 40,000. But there is one premiere place for Louisiana scientists and Louisiana science, and that's our *Proceedings*. Those old, discoloring pages are not only historical but also important, and the science we produce today should prove the same. During the upcoming years of my term as President, I ask for your support in support of our journal.

I hope you'll join me in keeping this in mind at the 90th annual meeting next month. See you there.

#### CHALLENGES FACING HIGHER EDUCATION IN LOUISIANA

## An Editorial by Riad Yehya

The purpose of this editorial is to examine the challenges facing higher education in Louisiana. These challenges include tuition sharp increase, decreasing university enrollment, reduced funding, low educational-attainment ranking, and inequity.

Whereas since 2010 the cost of tuition and fees of higher education has gone up significantly in the entire country, it was much higher in Louisiana. According to the 2014 College Board data, such increase averaged about 13 percent for all fifty states while it was 52 percent for Louisiana. That is, the hike in Louisiana public universities' tuition and fees has quadrupled that of the average of all fifty states.

The hikes in tuition and fees were also among the major reason for the drastic reduction in funding support provided by the State of Louisiana. The 2008 national recession pushed all state governments to reduce the money allocated by their budget to the institutions of higher education. The national-survey reports indicate clearly that since 2008 Louisiana reduced the funding for higher education more than any other state.

With an improving economy, while most states have ever since reversed course, Louisiana continued to slash higher education funding. For instance, under Governor Jindal's eight-year administration (2008-2015), the public funding of higher education was reduced by more than 53%, which was much deeper than that of any other state for this time period. According to published reports, Louisiana taxpayers provided 60 percent of the funding for Louisiana's public universities before 2008 whereas it's at the present time less than a quarter of the total cost.

This significant and dramatic reduction in public funding has had very significant implications for the institutions of higher education, their students, and their families, forcing the former to raise tuitions and fees and the latter to pay much more to fill the gap, opt not to seek bachelor's degrees, enroll in a community college, or pursue vocational training. Between 2009 and 2014, according to the State Higher Education Executive Officers Association, there were six states that witnessed decrease in university enrollment, and Louisiana was one of them.

In addition to skyrocketing tuitions, Louisiana students faced tougher admissions standards, forcing a good number of them to join two-year institutions, with a significant increase as compared to that of the years preceding the Jindal administration. Such increase, however, was not accompanied by relative increase in funding. According to some estimates, state aid to these schools is presently around half of what was earlier, before Jindal took office.

The impact of the above circumstances—drastic cuts in public funding and higher admissions standards imposed by the State of Louisiana—was tougher on the state's historically black colleges and universities (HBCUs). The reason is that since 2008 enrollment at the state's top three four-year public HBCUs has decreased by over 15 percent. To make the situation worse,

the percent of African-American students enrolled in Louisiana institutions of higher education decreased by 8 percent during the same time period.

Another challenge is raising Louisiana's educational-attainment rankings, defined as the percent of adults who earned an associate's or a bachelor's degree. Compared to other states, Louisiana's rankings were/are among the lowest in the entire United States. According to the College Board data, in 2014 Louisiana ranks near the bottom,  $48^{th/50^{th}}$  in educational attainment. Such rankings were perhaps among the main reasons pushing the two administrations of Kathleen Blanco and Mike Foster to make the funding of higher education a first priority. Under these two administrations, the support funding for Louisiana colleges and universities reached in 2007 the Southern Region's average for the first time. Governor Bobby Jindal and the Louisiana Legislature, however, reversed the earlier bipartisan collaboration aiming to raise the rankings of Louisiana's colleges and universities.

In light of university and college budget shortfalls, another challenge is addressing the amount of money spent on supporting athletic programs. All NCAA-affiliated athletic programs, particularly field athletics, need to be supported by large amounts of money except for those of LSU whose football and baseball teams make large annual profits that support LSU academics.

Last but certainly not least is addressing the inequity challenge. Financial scholarships and benefits are not fairly distributed. The funding of merit-based TOPS benefitting affluent students has sharply increased thanks mainly to tuition increase, from \$149.3 million in 2008 to \$277.1 million in 2015. The funding for need-based grants that benefit working-class students stagnates around \$25 million. For instance, over 95 % of LSU's roughly 4,400 in-state freshman class receives TOPS scholarships whereas the number of freshmen receiving TOPS scholarships at Southern University in New Orleans may often consist of a few students and could be counted on one hand. In a broader sense, White high-school graduates are about three times more likely to receive TOPS than African-American students. There is a social-class disparity as well. Around 75 percent of TOPS recipients come from affluent families, earning more than \$40,000, which is Louisiana's roughly median income.

#### **ACADEMY MEMBERS IN THE NEWS**

Dr. Raj Boopathy (Professor, Department of Biological Sciences, Nicholls State University) was elected Fellow of the International Union of Pure and Applied Chemistry (IUPAC) and Fellow of the International Forum on Bioprocessing (IFBIOP). Dr. Boopathy serves as Editor of the *International Journal of Biodeterioration & Biodegradation*, Senior Editor of *Renewable Bioresources*, and Associate Editor *Bioresource Technology*.

Dr. John Doucet (Dean of the College of Arts and Sciences, Nicholls State University) was reappointed to the Information and Education Committee of the American Society of Human Genetics.

Dr. Mostafa Elaasar (Professor, Department of Natural Sciences, Southern University at New Orleans organized the American Association of Physics Teachers workshops at SUNO, 9-10 January 2016. Dr. Elaasar received a grant titled "University-Laboratory Consortium for 'Research on the Science and Engineering of Signatures (ROSES)'" (\$330K) from the National Nuclear Security Administration (NNSA) MSIPP program. Dr. Elaasar, along with Drs. H. Kim and R. Belmasrour, also received a grant titled "University-Laboratory Consortium for Advanced Manufacturing (CAM)" (\$250K) from the NNSA MSIPP program.

Dr. Kevin Murphy (Assistant Professor, Department of Biology and Health Sciences, McNeese State University) was awarded the Alice M. & G. Russell Chambers Professorship in Pre-Med.

Dr. Jamie Newman (Assistant Professor of Biological Sciences, Louisiana Tech University) is the recipient of five grants awards: (1) "Microtopographical Effects on the Differentiation of Mouse Embryonic Stem Cells into Cardiomyocytes" (\$6K) from the LaSPACE Undergraduate Research Assistantship Program/Louisiana Space Consortium (LaSPACE), (2) "The Role of Mediator in Maintaining and Differentiating Human Mesenchymal Stem Cells" (\$300K) from the Louisiana Biomedical Research Network Summer Faculty Program, (3) "Fluorescence Imaging for Undergraduate Cell and Molecular Biology" (Co-PIs: Drs. R. Giorno and P. Hindmarsh) (\$66K) from the Louisiana Board of Regents Enhancement Grant Program, (4) "The Role of Notch Signaling in Mesenchymal Stem Cells" (\$5K) from the Louisiana Board of Regents Supervised Undergraduate Research Experience (SURE) Program, and (5) "Cardiomyocyte Generation for Cardiac Tissue Repair" (\$4.5K) from the LaSPACE Minority Research Scholar for Undergraduate Student Research Program.

Dr. B. Ramu Ramachandran (Hazel Stewart Garner Professor of Chemistry and Executive Associate Dean for Research, College of Engineering & Science, Louisiana Tech University) is the recipient of three grants/awards titled: (1) "Increasing Diversity in the Doctoral Student Populations at Louisiana Tech University 2015-19" (Co-PI) (\$95K) from the Louisiana Board of Regents/BoRSF/SREB Doctoral Diversity Program, (2) "Superior Graduate Fellows in Molecular Sciences and Nanotechnology 2015-20" (\$100K) from the Louisiana Board of Regents/BoRSF Graduate Fellows Grant Program, and (3) "RII Track-1: Louisiana Consortium for Innovation in Manufacturing and Materials (CIMM)" (Co-PI) (\$20M) from the National Science Foundation.

Dr. Yenumula B. Reddy (Professor and Program Coordinator of Computer Science, Department of Computer Science, Grambling State University) recently became a Senior Member in the Institute of Electrical and Electronics Engineers (IEEE), a Senior and Life Member in the Association for Computing Machinery (ACM), and a Fellow of the International Academy, Research, and Industry Association (IARIA). Dr. Reddy received a grant titled "AFRL-Collaborative Program-Sensor Research" (a sub-contract with Clarkson Aerospace Corporation) involving design and implementation of a cognitive radio cloud network and high performance GP-GPU computing in Federated Hadoop Systems (\$1.3M) from the Air Force Research Consortium. Dr. Reddy also received a grant titled "Robot Training" (a sub-contract with Winston-Salem University) (\$75K) from the National Science Foundation. Dr. Reddy served as Program Committee Chair for the 12th International Conference on Information Technology:

New Generations (ITNG) in Las Vegas, Nevada, and currently serves as Chair of the International Symposium on Networking and Wireless Communications (ITNG).

Dr. Penny Shockett (Associate Professor, Department of Biological Sciences, Southeastern Louisiana University) received a grant titled "Modulation of Mitochondrial DNA with Exercise" (\$4.5K) from the LA EPSCoR (NSF)/Louisiana Board of Regents Supervised Undergraduate Research Experience (SURE) Grant Program.

Dr. Christopher Struchtemeyer, Dr. William Dees, Dr. Caroline Hennigan (Assistant Professor, Professor, and Instructor, respectively, Department of Biology and Health Sciences, McNeese State University) and Janet Woolman (Office of Economic Development, McNeese State University) received the 2015 Pinnacle Excellence Award (College of Science). The award, established by Pinnacle Entertainment Inc. (parent company of L'Auberge Casino Resort Lake Charles), recognizes outstanding faculty achievement in each of the colleges at McNeese State University.

Dr. Darcey Wayment (Associate Professor, Department of Physical Sciences [Chemistry], Nicholls State University) received a grant titled: "Enhancing the Chemistry Curriculum through the Acquisition of a Gas Chromatograph-Mass Spectrometer" (\$102K) from the Louisiana Board of Regents, Undergraduate Enhancement Program.

#### **RECENT PUBLICATIONS OF ACADEMY MEMBERS**

Bergeron, S., R. Boopathy, R. Nathaniel, A. Corbin and G. LaFleur. 2015. Presence of antibiotic resistant bacteria and antibiotic resistance genes in raw source water and treated drinking water. *International Journal of Biodeterioration & Biodegradation* 102:370-374.

Boopathy, R. 2014. Biodegradation of 2,4,6-trinitrotolune (TNT) under sulfate and nitrate reducing conditions. Biologia 69:1264-1270.

Boopathy, R., C. Kern and A. Corbin. 2015. Use of *Bacillus* consortium in waste digestion and pathogen control in shrimp aquaculture. *International Journal of Biodeterioration & Biodegradation* 102:159-164.

Champagne, D. and P. Shockett. 2014. Illegitimate V(D)J recombination-mediated deletions in Notch1 and Bcl11b are not sufficient for extensive clonal expansion and show minimal age or sex bias in frequency or junctional processing. *Mutation Research* 761:34-48.

Couger, M.B., N.H. Youssef, C.G. Struchtemeyer, A.S. Liggenstoffer and M.S. Elshahed. 2015. Transcriptomic analysis of lignocellulosic biomass degradation by the anaerobic fungal isolate *Orpinomyces* sp. strain C1A. *Biotechnology for Biofuels* 8:208.

- Everage, T.J., R. Boopathy, R. Nathaniel, G. LaFleur and J. Doucet. 2014. A survey of antibiotic resistant bacteria in a sewage treatment plant in Thibodaux, Louisiana, USA. *International Journal of Biodeterioration & Biodegradation* 95:2-10.
- Gogami, T., ...M. Elaasar et al. 2015. High resolution Λ hypernuclear spectroscopy with electron beams [Proc. 2nd Int. Symp. Science at J-PARC Unlocking the Mysteries of Life, Matter and the Universe]. *JPS Conf. Proc.*: 021010.
- Meyer, H.A. 2015. Water bears (Phylum Tardigrada) of Oceania, with description of a new species of *Milnesium*. *New Zealand Journal of Zoology* 42(3):1-14.
- Naquin, A., J. Clement, M. Sauce, R. Grabert, M. Sherpa and R. Boopathy. 2014. Presence of antibiotic resistant *Staphylococcus aureus* in sewage treatment plant. *Journal of Water Sustainability* 4:227-236.
- Naquin, A., A. Shrestha, M. Sherpa, R. Nathaniel and R. Boopathy. 2015. Presence of antibiotic resistance genes in a sewage treatment plant in Thibodaux, Louisiana, USA. *Bioresource Technology* 188:79-83.
- Newman, J.J., N. Patel and M. Caldorera-Moore. 2016. Engineered stem cell-based scaffolds and patches for heart disorders. Chapter 14 in: *Microscale Technologies for Stem Cells Engineering*. Springer.
- Reddy, Y.B. 2014. Cloud environment on cognitive radio network for efficient resource allocation. In: *Advances in Ad Hoc Networks Research*. Nova Science Publishers, Inc.
- Reddy, Y.B. 2015. Proposed GPU based architecture for latent fingerprint matching. *International Journal of Computer Science and Information Security* 13(10):72-78.
- Reddy, Y.B. and D. Hill. 2015. Document selection using MapReduce. *International Journal of Security, Privacy and Trust Management* 4(3/4):1-10.
- Shockett, P., J. Khanal, A. Sitaula, C. Oglesby, W. Meachum, V.D. Castracane, and R. Kraemer. 2016. Plasma cell-free mitochondrial DNA declines in response to prolonged moderate aerobic exercise. *Physiological Reports* 4(1):1-9.
- Struchtemeyer, C.G., N.H. Youssef and M.S. Elshahed. 2014. Protocols for investigating the microbiology of drilling fluids, hydraulic fracturing fluids, and formations in unconventional natural gas reservoirs. In T.J. McGenity et al. (eds.), *Hydrocarbon and Lipid Microbiology Protocols*. Springer-Verlag, Berlin Heidelberg.
- Struchtemeyer, C.G., A. Ranganathan, M.B. Couger, A.S. Liggenstoffer, N.H. Youssef and M.S. Elshahed. 2014. Survival of the anaerobic fungus *Orpinomyces* sp. strain C1A after prolonged air exposure. *Scientific Reports* 4:4682.

Wayment, D.G. and G.V. Lo. 2014. Analysis of nitroaromatic explosives by high performance liquid chromatography: A laboratory exercise for quantitative analysis. The *Chemical Educator* 19:363-366.

Woolman, J.R., W.H. Dees and J.M. Daboval. 2015. Promoting productive public and private partnerships. In R. Dunfee and A. K. Vaidya (eds.), *Operationalizing Stewards in Place*, *American Association of State Colleges and Universities*, Washington, DC. pp. 107-128.

Young, K.E., C.H. Young, M.M. Dunham, S.-P. Lai, and N.J. Evans II. 2015. The Spitzer c2d Survey of large, nearby interstellar clouds. XII. The Perseus YSO Population as observed with IRAC and MIPS. *Astrophysical Journal* 150:40.

#### **CORRIGENDUM**

# Corrections to the Official Program of the 89<sup>th</sup> Annual Meeting of the Louisiana Academy of Sciences at Nicholls State University 14 March 2015

Please contact Dr. Bill Dees, *Bulletin* Abstract Editor if you need a complete copy of the revised program. His email address is wdees@mcneese.edu.

## Molecular & Biomedical Biology Poster Competition

\*Khanal J, Sitaula A, Shockett P, Kraemer R (SLU)

Decline in relative plasma cell-free mitochondrial DNA levels in response to prolonged

[10:00-11:45 AM Student Oral Presentations (\*\*competition)] Chemistry / Microbiology / Molecular & Biomedical Biology Oral Presentation Session

9:30\*\* Bhasker Ranganath S, Hassan AS, Wick CD Ramachandran BR (LTU)

Computational studies on transition metal oxides as lithium-ion battery anode materials

# **Physics II**

Poster Gyawali S, Mainardi D (LTU)

Study of structure, stability and catalytic activity of transition metal cluster for Fischer Tropsch reaction using first principle DFT

 $Environmental\ Science\ /\ Zoology\ II\ /\ Molecular\ \&\ Biomedical\ Biology\ II$ 

Poster Sorgee, B, Broussard G, Meyer HA (MSU)

moderate aerobic and eccentric exercise

Photokinesis and gravikinesis in the terrestrial water bear *Minibiotus acadianus* 

# **Materials Science & Engineering II / Math & Statistics**

2:30 Dillon A, Elaasar M, Tietzel I, Belmasrour R (SUNO)
The performance indicators of elementary school students

# Zoology / Environmental Sciences / Agriculture, Forestry & Wildlife

- P15 Klumpp M, Gladney L, Meyer H, Hinton J (MSU) Tardigrada of Antigua, West Indies
- P16 Ardizzone C, Dees W, Theriot J, Leonards K, Fusilier A, Hightower J, (MSU) Christian O, Woolman J, Cochran, M Screening plant parts for potential mosquitocidal compounds
- P18 Dees W, Foley D, Pecor D, Burkett D, Rueda L
  Wilkerson R, Ardizzone C, Fusilier A (MSU, Walter Reed AIR, Smithsonian)
  An online repository for biosurveillance data for disease risk assessment

# **Material Science & Engineering**

P40 Thapa S, Ardizzone C, Zhang N, Fogg H, Hardee L, Yadav P, Dees W, Woolman J (MSU)

Development of a bioassay chamber for investigating innovative mosquito control techniques

#### **Computer Science / Math & Statistics**

P45 Hardee L, Dees W, Petticrew L, Ardizzone C, Thapa S, Fogg H, Woolman J (MSU) Louisiana Environmental Research Center at McNeese: Developing an ADA accessible website

## INFORMATION ON THE 2016 MEETING

**JOIN US FOR** 

# LAS\*90

The 90th Annual meeting of the Louisiana Academy of Sciences

Celebrating 90 Years of Scientific Excellence and Fellowship
Saturday, 12 March 2016
LSU at Alexandria

For further information, visit: http://www.laacademy.org/meeting.html

## **Directions to the LSU-A Campus**

All travelers should turn off Highway 71 onto Grady Britt Drive. Since there should be ample parking in the Science Building lot which will be on your left as you drive onto campus.

**From Baton Rouge:** Take Interstate 10 or Highway 190 west to Interstate 49 north. From I49 take the Turkey Creek/Meeker exit onto Highway 167 north. The road will dead end at Highway 71. Turn north on Highway 71/167 through Lecompte. Campus will be approximately 9 miles north on the right.

**From Lafayette:** Take Interstate 49 north. From I49 take the Turkey Creek/Meeker exit onto Highway 167 north. The road will dead end at Highway 71. Take Highway 71/167 north through Lecompte. Campus will be approximately 9 miles north on the right.

**From Lake Charles:** Take Highway 165 north to Highway 112 in Forest Hill. Go east on Highway 112 to Highway 71. Go north on Highway 71 approximately 7 miles. Campus will be on your right.

**From Monroe:** Take Highway 165 south to Highway 167 south. From Highway 167 exit onto Interstate 49 south. At exit 80 go south on Highway 71 for approximately 5 miles. Campus will be on your left just south of the intersection with Highway 3170.

**From Ruston:** Take Highway 167 south. Exit onto Interstate 49 south to exit 80. Go south on Highway 71 for approximately 5 miles. Campus will be on your left just south of the intersection with Highway 3170.

**From Shreveport:** Take Interstate 49 south to exit 80. Take Highway 71 South. Stay on Highway 71 for approximately 5 miles. The campus will be on your left just south of the intersection with Highway 3170.

#### **ADMINISTRATION OF THE ACADEMY**

(CURRENT AS OF THIS PRINTING)

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