

IN MEMORIAM

Girma Biresaw

STLE Fellow **Girma Biresaw** passed away Sept. 8 at age 72. He was chair of the STLE Fellows Committee and served as a course instructor in biolubricants and biofuels for the STLE Annual Meeting education program. He also was a TLT Technical Editor.

Biresaw was born in Addis Ababa, Ethiopia. He earned two bachelor's of science degrees, one in mathematics from St. Augustine's College and one in textile chemistry from North Carolina State University, Raleigh, N.C. He received his doctorate in physical-organic chemistry from the University of California, Davis. As a postdoctoral Research Fellow at the University of California, Santa Barbara, he investigated reaction kinetics and products in surfactant-based organized assemblies for four years. As a scientist at the Aluminum Company of America, he conducted research in tribology, surface/colloid science and adhesion for 12 years.

Biresaw was a research chemist/lead scientist at the USDA-ARS-National Center of Agricultural Utilization Research Center in Peoria, Ill., where he was conducting research in tribology, adhesion and surface/colloid science in support of programs aimed at developing biobased products from farm-based raw materials. Most recently, Biresaw spent most of his efforts working on chemical modification of vegetable oils that resulted in improved tribological proper-



Girma Biresaw

ties as well as new biobased antiwear phosphonate additives with comparable properties to commercial petroleum-based products. Biresaw's career accomplishments have been commercialized at manufacturing locations in the U.S., The Netherlands and Brazil.

Biresaw had authored/co-authored more than 300 scientific publications, including more than 85 peer-reviewed manuscripts, six patents and seven edited books. Biresaw was an Editorial Board Member for the Journal of Biobased Materials and Bioenergy.

In honor of Biresaw, the STLE Nonferrous Council has made a memorial donation to STLE's STEM program. This donation helps continue programs that encourage students to learn about tribology and lubrication science through the STLE Annual Meeting STEM Camp, poster contests, the E. Richard Booser Scholarship, the Jeanie S. McCoy Scholarship and the Elmer E. Klaus Fellowship. STLE thanks the Nonferrous Council for their generosity.

STLE LOCAL SECTION SCHOLARSHIPS

STLE Philadelphia Section awards scholarships

The **STLE Philadelphia Section** has awarded scholarships to 11 deserving students doing research in nearby universities.

Working under the direction of STLE-member professor David L. Burris, University of Delaware student **K. Istiaque Alam's** research aims to bridge the gap between composite design and interfacial stability, providing new insights into the origins of tribological synergy and providing a pathway toward maximizing tribological performance in practical material design. The goal of his dissertation is to systematically trace low friction and ultra-low wear of the few known polymeric solid lubricant exemplars back to their microstructure, a controllable aspect of materials design and develop a predictive framework to design ultra-stable surfaces and interfaces. Over the course of his graduate studies, Alam will have published eight peer-reviewed journal papers, including four as the lead author, and has already delivered 12 podium presentations at national conferences and won several competitive research awards that includes best poster award at the STLE Annual Meeting and Tribology Frontiers Conference.

Yollem Miranda Alarcon is a Rutgers University biomedical engineering doctoral candidate. Alarcon received her undergraduate degree in chemistry from Fordham University-Rose Hill Campus, New York. With a particular interest in teaching science, she joined the American Chemistry Society, where she did significant outreach work in high schools to make science a more approachable field of study. As an undergraduate, Alarcon worked in

different research projects in synthetic organic chemistry and biochemistry with a focus on tissue engineering. The latter inspired her to continue graduate studies in the field of biomedical engineering. Alarcon is currently pursuing her doctorate in biomedical engineering at Rutgers University. She is working toward developing personalized treatments for skin wounds as part of her graduate research project.

Working under the direction of STLE-member Dr. Brandon Krick, Lehigh University student **Tomas Babuska** has been involved in numerous tribology-related projects, ranging from polymer nanocomposite synthesis and testing, oxidation and run-in of MoS₂ and MoS₂ composites, ultra-low wear of plasma-enhanced transition metal nitrides, additive manufacturing of brittle intermetallic alloys and wear of grinding dentition enamel structures. Although he has not yet completed his doctorate proposal, it will likely center on tribology of MoS₂ for space applications. Babuska has already written several successful proposals, including one for NSF and a few that utilized the synchrotron at Brookhaven National Laboratory. He also has made five presentations at STLE Annual Meetings in the materials tribology section and has presented seven posters at the Gordon Tribology Conference over the past three years. In 2020, he was awarded the STLE Early Career Award.

Rishabh Chaudhary is a graduate student pursuing his master's in mechanical engineering at the University of Maryland, College Park. He works with professor Michael

G. Pecht and Dr. Michael H. Azarian in comprehending the performance of electrical contacts present in connectors and switches, primarily when they undergo the fretting mechanism. Chaudhary's research aims to compare some lubricants' effectiveness over others and determine the failure mechanisms, causes and effects that drive their performance. He looks forward to working in the electronics industry, specifically in electrical contacts, and sharing his experience and knowledge. He is skilled in design for reliability, root cause analysis, FMEA and FMECA and reliability modeling and data analysis, all of which are a boon for a system's reliable functioning over its intended functional life.

Rutgers University student **Madara Dias** has completed her bachelor's of science degree in biomedical engineering with a concentration in mechanical engineering and a minor in mathematics, and is currently pursuing a master's of science degree in biomedical engineering with a certificate in medical device and design development. Dias is an outstanding student, with a 3.78 cumulative GPA in her undergraduate studies and a 4.0 GPA in graduate work. She was recently awarded the Rutgers University Chancellor's Award for Research and Excellence, for her research accomplishments, academic excellence and commitment to leadership and involvement on campus and in the community. Dias is dedicated to giving back to others through her work, and this is reflected in her thesis project under Dr. Kristen Labazzo, which is focused on designing and developing a dynamic lateral support for wheelchair users, which can provide significantly improved freedom and indepen-

dence for many patients.

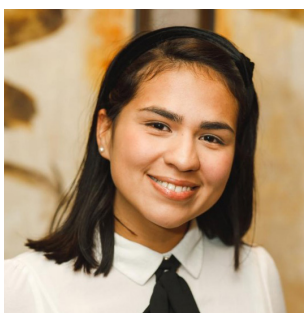
Wilkes University student **Jonah Harder** is majoring in mechanical engineering and completed his junior year in the 2019-2020 academic year. Harder is a Dean's list student, carrying a 3.95 GPA over his first three years at Wilkes. His faculty advisor describes him as an innovative and analytical thinker, showing hard work and dedication in his academic endeavors. In particular, Harder has shown great aptitude in applying programmable logic controller skills to engineering problems.

University of Delaware biomedical engineering doctoral candidate **Meghan Kupratis** is a second-year doctorate student working with professor Christopher Price. Her doctoral research focuses on understanding how modulating cartilage's hydration influences its tribological and biological performance. Recently, her team discovered that sliding drives interstitial fluid exuded during loading back into the tissue, restoring its hydration and thickness while maintaining wear-free motion through a process called "tribological rehydration." Kupratis uses a novel tribological testing configuration to understand how cartilage's material properties (i.e., stiffness and permeability) influence tribological rehydration, as well as how differences in these material properties affect the tissue's response to various loading and articulation conditions. Ultimately, Kupratis' research will provide insights into cartilage health and disease that could lead to strategies for using activity to improve joint longevity. Kupratis was named the recipient of STLE's Jeanie S. McCoy Scholarship in 2020.

Villanova University mechanical engineering undergraduate student **Rachel Lambert**



From left to right: Scholarship winner K. Istiaque Alam and STLE-member professor David Burris.



Scholarship winner Yoliem Miranda Alarcon.



Scholarship winner Tomas Babuska.



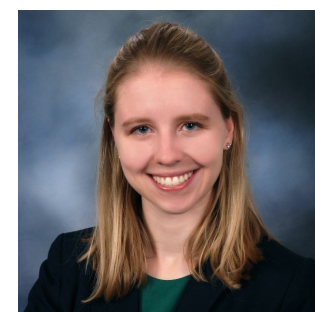
Scholarship winner Rishabh Chaudhary.



Scholarship winner Madara Dias.



Scholarship winner Jonah Harder.



Scholarship winner Meghan Kupratis.

is a dedicated, exceptional student, having earned a 3.97 GPA thus far in her studies. She has demonstrated a unique desire to learn and has a “robust intuition for physical systems,” according to her physics professor. Although still early in her academic career, she has shown a strong interest in materials, lubrication and mechanical interactions, including their impact on practical applications and society. Some of Lambert’s specific interests relate to the mechanisms and lubrication of roller coasters and similar rides.

University of Maryland math and engineering student **Nathan Purnell** is going into his fourth year as a mechanical engineering student. He is an eagle scout who enjoys doing volunteer work and tutoring peers in math and engineering classes. He was a part of the University of Maryland First-Year Innovation & Research Experience program for his first two years of college where he learned how to effectively perform research analysis and tackle design challenges. During breaks over the past few years, he has worked as a mechanical engineering intern at Backbone Mechanical Design, got some experience in the construction field installing commercial windows with Accurate Weatherstrip & Screen and studied abroad in Costa Rica where he learned about engineering sustainability. He is immensely excited to begin working as a mechanical engineer after graduation next year.

Paradorn (Joe) Rummaneeethorn is a University of Pennsylvania chemical and biomolecular engineering doctoral candidate. Working under the direction of professor Daeyeon Lee, Rummaneeethorn’s research is focused on reversible

droplet wetting on chemically inert substrates using corona discharge-based space charge injection. In addition to his research, Rummaneeethorn is a dedicated learner and has become a leader among the students in the department, school and beyond. He served as co-chair of the Chemical Engineering Graduate Student Association—having led the organization of various department activities—and now serves as the president of the Graduate Student Engineering Group and president of the American Chemical Society Biochemical Technology Division Mid-Atlantic graduate student chapter.

University of Maryland mechanical engineering doctoral candidate **Harnoor Sachar** is a doctorate student under Dr. Siddhartha Das in the department of mechanical engineering. His work involves modeling the thermodynamics of polyelectrolyte brush grafted interfaces as well as flows in polyelectrolyte brush grafted nanochannels. Polyelectrolyte brushes aid in lubrication by reducing the friction coefficient between two shearing surfaces. On the one hand, he uses continuum modeling to develop new theories for describing polyelectrolyte brush systems. On the other hand, he uses state-of-the-art molecular dynamics (MD) simulations to study the structure of polyelectrolyte brushes at atomistic length scales. His eventual goal is to use the MD results to validate as well as rectify the existing continuum models, thereby improving our understanding of these promising nanoscale systems.

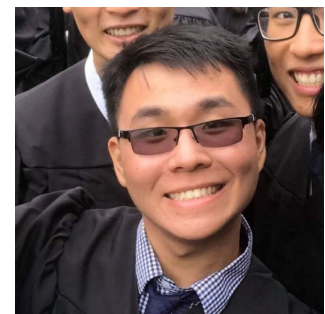
The Philadelphia Section received STLE’s Outstanding Section of the Year award in 2013, 2015, 2016 and 2017.



Scholarship winner Rachel Lambert and Dr. Christopher D. Brown.



Scholarship winner Nathan Purnell.



Scholarship winner Paradorn (Joe) Rummaneeethorn.



Scholarship winner Harnoor Sachar.

Want to be recognized in TLT? If you have news about a new employee or if someone in your company has been recognized with an award or any other interesting items, let us know. Please send us your news releases and photos for publication in Newsmakers to TLT Magazine, Attn: Rachel Fowler, 840 Busse Highway, Park Ridge, IL 60068, rfowler@stle.org.