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Honors and Awards

The 2022 Keithley Award

The Joseph F. Keithley Award for Advances in Measurement Science is awarded annually to a physicist who has been instrumental in the development of measurement techniques or equipment that have impact on the physics community by providing better measurements. The award is endowed by Keithley Instruments, Inc. and the Topical Group on Instrument and Measurement Science.

Dr. Daniel Rugar is a Distinguished Research Staff Member and Manager of Quantum Devices and Measurements in the IBM Research Division. He began his career in the field of scanning microscopy as a Ph.D. student at Stanford, where he developed gigahertz-frequency acoustic microscopes operating in superfluid helium. After joining IBM in 1984, he contributed to the development of non-contact atomic force microscopy, especially for imaging magnetic materials. His group’s early work on magnetic force microscopy helped establish this technique as a standard tool for magnetic materials research and spintronics. Pushing the limits of mechanical force detection, his group’s achievement of attonewton sensitivity enabled the measurement of electron and nuclear spin resonance at the nanometer scale. This work culminated in the detection of an individual electron spin and the demonstration of 3D nuclear magnetic resonance imaging (MRI) with better than 10 nm spatial resolution. Rugar’s group has also investigated the use of NV-centers in diamond for nanoscale MRI and is currently focused on improving the performance of superconducting qubits.

Dr. Rugar graduated from Pomona College in 1975 and received a Ph.D. in Applied Physics from Stanford University in 1982. He has served as a Distinguished Lecturer of the IEEE Magnetic Society and was co-
recipient of the Laukien Prize and the Cozzarelli Prize for the development of magnetic resonance force microscopy. He is a Fellow of the APS, AAAS and IEEE.

Dr. H. Jonathon (John) Mamin is a Principal Research Staff Member at the IBM Almaden Research Center, which he joined in 1987. He has a longstanding interest in developing novel uses for scanning probe techniques, dating from his days as a postdoctoral fellow at the University of California Berkeley in the then-emerging field of scanning tunneling microscopy. His work at IBM has ranged from early imaging of magnetic bits in hard disk drive material, to pushing the limits of ultrasensitive force detection, to mechanical detection of a single electron spin. He has used both cantilever-based force detection as well as optical detection of nitrogen-vacancy centers to show that magnetic resonance imaging can be extended into the nanoscale. More recently, he has returned to his roots in superconducting phenomena, and is currently part of the IBM Quantum effort.

Dr. Mamin is a Fellow of the American Physical Society and co-recipient of the Gunther Laukien Prize and Cozzarelli Prize, both for achievements in the field of magnetic resonance. He received his B.S. in physics from Stanford University in 1978 and his Ph.D. in physics from UC Berkeley in 1984 under Professor John Clarke.

GIMS would like to extend our thanks to the 2022 Keithley Award selection committee: Angela Di Fulvio (Chair), Irfan Siddiqi (2021 Keithley Award Recipient), Vesna Mitrovic, Christie Nelson, and Amanda Petford-Long. We are pleased to announce that Prof. Irfan Siddiqi will Chair the next Keithley Committee.

**2021 GIMS APS Fellowship**

The APS Fellowship Program was created to recognize members who may have made advances in physics through original research and publication, or have made significant innovative contributions in the application of physics to science and technology. They may also have made significant contributions to the teaching of physics or service and participation in the activities of the Society.

The recipient of the 2021 APS Fellowship from the Topical Group on Instrument and Measurement Science is Dr. Andrew R. Lupini from Oak Ridge National Laboratory. His citation reads: “For groundbreaking contributions to the fields of electron microscopy and aberration-correction in scanning transmission electron microscopy and for the development of new image and spectroscopy capabilities, higher-resolution, and better sensitivity to atomic-resolution imaging and spectroscopy.”

Andrew R. Lupini
Oak Ridge National Laboratory

Dr. Lupini obtained his Ph.D. in Physics from the Cavendish Laboratory of Cambridge University in 2001, under the supervision of Dr. Andrew Bleloch. He is one of the inventors of the first aberration-corrector in a scanning transmission electron microscope to demonstrate an improved resolution. He is currently a R&D staff member in the Center for Nanophase Materials Sciences of Oak Ridge National Laboratory in Tennessee. His research interests include all forms of electron
microscopy and spectroscopy, especially as applied to new or quantum materials.

GIMS would like to thank the members of the 2021 APS Fellowship committee: Catherine Pappas (Chair), Art J. Nelson (2020 GIMS APS Fellow), Chris Jacobsen, Elias Garratt, Peter Grütter, and Angela Hight Walker.

GIMS Student Presentation Awards

In 2021, GIMS launched a new Student Presentation Award in conjunction with the APS March Meeting. In total, ~50 student participants in the GIMS sessions competed for these awards. A panel of judges evaluated all contributed oral presentations and selected six award winners for their outstanding presentation of high-impact work representing significant advances in the field of instrumentation or measurement sciences. The 2021 Presentation Award winners were:

- Jyotirmai Singh – Stanford University (Graduate)
- Elizabeth van Assendelft – Stanford University (Graduate)
- Okan Koksal – Cornell University (Graduate)
- Chris Adambukulam – University of New South Wales (Graduate)
- Juliet Nwagwu – Harvard University (Undergraduate)
- Stephen Taylor – Stanford University (Graduate)

All winners will receive an APS certificate recognizing their achievement along with a monetary prize. Congratulations to all of our award winners!

GIMS would like to thank our 2021 Student Awards Committee: Shan Wu (Chair), Matthew Smylie, and Lahsen Assoufid.

We are also grateful to our panel of judges: Michael Armstrong, Patrick Clancy, Angela Di Fulvio, Alex Frano, Elias Garratt, Joseph Hagmann, Stephen Jesse, Roger Proksch, and Laurel Winter.

The 2022 Student Presentation Award competition will be held at the APS March Meeting in Chicago (Mar. 14th to 18th). The competition is open to any undergraduate or graduate student who: (a) has not yet received a PhD degree, and (b) is giving a contributed oral presentation in a GIMS-sponsored session.

GIMS at the APS March Meeting

The 2022 APS March Meeting will be held in Chicago, Illinois from March 14th to 18th. In light of the ongoing COVID-19 pandemic, this year’s March Meeting is also expected to have a significant online component. With ~95 abstracts received for GIMS-sponsored sessions, we look forward to an exciting scientific program. Details of the program will be posted on the March Meeting website (https://march.aps.org/) in January 2022 and registration is expected to open later this month. We would like to extend our thanks to the members of the 2022 Program Committee Members: Chris Jacobsen (Chair), Antonella Badia, Sarah Burke, Angela Di Fulvio, Alex Frano, Angelika Kühnle, Emily Mace, Melissa Santala, Laurel Winter, and Shan Wu.

GIMS Student Travel Grant

GIMS will be awarding one student travel grant for the 2022 March Meeting. To be eligible for this grant, applicants must: (a) be an active student or postdoc at an accredited degree-granting institution or government research laboratory, (b) be an APS member, and (c) be the first author of a paper in a GIMS sponsored session at the March Meeting. The deadline for applications is February 14, 2022. For more detailed instructions, please visit the APS website.
GIMS Election Update

Each year GIMS holds an election to fill vacant offices on the executive committee. For more details, please refer to the GIMS Bylaws webpage at: https://engage.aps.org/gims/governance/bylaws.

In 2021, three new members were elected to the GIMS executive committee:

Catherine Pappas  Shan Wu  Laurel Winter

Vice Chair: Prof. Dr. Catherine Pappas, Delft University of Technology
Member-at-Large: Dr. Shan Wu, Lawrence Berkeley National Laboratory
Member-at-Large: Dr. Laurel Winter, Los Alamos National Laboratory

A warm welcome to Katia, Shan, and Laurel! A full list of the current GIMS executive can be found at:
https://engage.aps.org/gims/governance/executive-committee

In the upcoming 2022 GIMS election, we will be looking to fill positions for one Vice Chair, one Secretary-Treasurer, one Early Career Physicist and two Members-at-Large. Note that Vice Chair is the entry position for a four stage Vice Chair, Chair Elect, Chair, Past Chair progression. An Early Career Physicist must be within five years of receiving their final degree. If you are interested in standing for election to a position on the GIMS executive committee, please contact Stephen Jesse, Chair of the Nominating Committee (sjesse@ornl.gov). The 2022 election is scheduled to take place in the last week of January, with more details to be circulated shortly.

The members of the 2022 Nomination Committee are: Stephen Jesse (Chair), Oak Ridge National Laboratory, Stefan Zollner, New Mexico State University, and Roger Proksch, Oxford Instruments.

Call for Nominations

The GIMS executive is currently seeking volunteers and nominations for a variety of positions and awards:

GIMS Executive Committee – The 2022 GIMS Election will include votes for one position as Vice Chair, one position as Secretary-Treasurer, one position as Early Career Physicist, and two positions as Member-at-Large.

GIMS Appointed Committee Members – There will also be openings on several GIMS committees in the new year, including the Keithley Award, Student Award, GIMS Fellowship, Nomination, Program, and Publication committees. Volunteers for committee service are welcome at any time.

Joseph F. Keithley Award for Advances in Measurement Science – The Keithley Award is presented annually to one person, or a small group of individuals working in the same area, for outstanding advances in measurement science or instrumentation that impact the physics community by providing better measurements. Details of the award and the nomination process are available at https://www.aps.org/programs/honors/prizes/keithley.cfm. Nominations for the 2023 Keithley Award are due by June 1st, 2022.

APS Fellowship – Each year the GIMS Fellowship committee selects nominees for APS Fellowships based on proposals submitted by the GIMS membership. The nomination process is described at: https://www.aps.org/programs/honors/fellow
Nominations for the 2022 GIMS Fellowship are due by June 1st.

The membership of the APS is diverse and global, so officers, committee members, Prize and Award winners, and Fellows of the APS should reflect that diversity. Nominations of members belonging to traditionally under-represented groups in physics, such as women, LGBT+ scientists, scientists who are Black, Indigenous, and people of color (BIPOC), and disabled scientists are especially encouraged. We also welcome nominations for scientists from outside the United States.

Mark your Calendars: GIMS 40th Anniversary Celebrations

The APS Topical Group for Instrument and Measurement Science (GIMS) was formed in 1984 to encourage precision in measurements, to encourage development of instrument and measurement science, to provide a forum for discussions of these topics, and to provide professional recognition of the importance of instrument and measurement science. We are rapidly approaching the 40th birthday of GIMS: the “ruby anniversary” of our topical group. Please stay tuned for special events to commemorate this milestone at the 2024 APS March Meeting in Minneapolis.

Advocate for GIMS

GIMS provides services to its membership that include:
- A path to APS fellowship based on work in instrument and measurement science
- The Keithley Award for instrumentation
- Focus sessions at the March Meeting
- Organization of March Meeting sessions
- Student Travel Grants
- A voice in governance of the APS

Please bring GIMS to the attention of your colleagues and encourage them to join as members. GIMS seeks to reflect the society around us, so we would particularly encourage you to reach out to your younger colleagues, and members of traditionally under-represented groups. The success of GIMS depends on your continued enthusiasm and support!

The articles in this newsletter represent the views of the GIMS Publication Committee and are not necessarily those of individual GIMS members or the APS. Suggestions for future news items or highlights from the membership are strongly encouraged. Any questions, comments or corrections regarding the newsletter should be directed to the Chair of the Publication Committee (Patrick Clancy, clancyp@mcmaster.ca) or the GIMS Secretary-Treasurer (Zahir Islam, zahir@anl.gov).