

Instrument and Measurement Science

FEBRUARY 2014

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<http://units.aps.org/units/gims>

The Topical Group on Instrument and Measurement Science (IMSTG/GIMS) of the American Physical Society 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.

The articles in this issue represent the views of the GIMS publication committee and are not necessarily those of individual GIMS members or the APS.

I. APS Keithley Award for 2014



The 2014 Keithley Award is awarded to:

Franz J. Giessibl
Universitaet
Regensburg

Citation:
"For the invention of highly improved sensor technology for atomic force microscopy and the demonstration of the novel capabilities that this enabled."

The Keithley Award will be presented at the March meeting in Denver on Monday March 3 at 5:45 pm. GIMS is organizing invited symposium to honor the prizewinners on Wednesday March 5, Room 709/711. More information is provided below.

II. APS/GIMS Fellows for 2013

Every year APS elects several of its distinguished members to Fellowship. Each nomination is evaluated by the Fellowship committee of the appropriate APS division, topical group, or forum. This year GIMS elected the following three scientists to Fellowship:

Stephen Holland

Lawrence Berkeley National Laboratory
Citation: *For the invention of the fully-depleted charge-coupled devices (CCDs) whose extended near-infrared sensitivity*

enables imaging and spectroscopic surveys of the Universe, detecting light that was emitted billions of years ago. This technology has also enabled new x-ray and gamma-ray instrumentation.

Marilyn Schneider

Lawrence Livermore National Laboratory
Citation: *For outstanding contributions to x-ray measurements from laser-produced plasmas.*

Daniel Shaddock

Australian National University
Citation: *For pioneering development of precision optical interferometry in space, particularly for the detection of gravitational waves and for mapping the gravitational field of the earth.*

GIMS is asking its members to make nominations to APS Fellowship for 2014. Nominations are due on May 1st. Details on the nomination process can be found at: <http://www.aps.org/programs/honors/fellowships/index.cfm>.

III. GIMS Selection Committees

APS KEITHLEY AWARD

For awarding at the 2014 March Meeting:
T. Jach (chair), A. Migliori, N. Mavalvala (2013 Keithley awardee), R. Schnabel (2013 Keithley awardee), B. Zink

APS/GIMS FELLOWSHIP

For awarding at the 2014 March Meeting:
D. Mills (chair), A. Migliori, F. Balakirev.

IV. GIMS Sessions at March Meeting 2014 in Denver, Colorado

GIMS session chairs should encourage session attendees to join GIMS.

INVITED SYMPOSIA:

GIMS is organizing two symposia at the March Meeting in Denver. The Keithley award symposium on Wednesday morning (11:15 AM) brings together five experts on submolecular resolution and exchange force measurements using atomic force microscopy with quartz cantilevers. For more details on the 2014 Keithley award see the article elsewhere in this newsletter and the lists with invited speakers provided below. The second symposium is on quantitative biomedical imaging and takes place on Friday morning (8:00AM).

By bringing together expertise on innovative instrumentation development GIMS hopes to spark interest within the measurement science community for the development of new instruments suitable to solve some of the materials science issues that we currently face.

Details on the sessions and invited speakers of the symposia are provided below.

Session M38 Invited Session: The Keithley Award Session: Submolecular Resolution and Exchange Force Measurements Using Atomic Force Microscopy with Quartz Cantilevers
Wednesday March 5, Room 709/711
Chair: Joseph Stroschio, *National Institute of Standards and Technology*

11:15 – 11:51 AM:
M38.00001: Joseph F. Keithley Award: Force microscopy with subatomic spatial resolution
Keithley Award winner: Franz Giessibl

11:51 AM – 12:27 PM:
M38.00002: Mapping the force-field of a hydrogen bonded assembly,
Invited speaker: Philip Moriarty

12:27 – 1:03 PM:
M38.00003: Single molecules using atomically functionalized gPlus sensors,
Invited speaker: Leo Gross

1:03 – 1:39 PM:
M38.00004: Dynamic force imaging and spectroscopy of individual molecules,
Invited speaker: Jascha Repp

1:39 – 2:15 PM:
M38.00005: Real-space identification of intermolecular bonding with atomic force microscopy,
Invited speaker: Xiaohui Qiu

Session Y38 Invited Session: Quantitative Biomedical Imaging
Friday March 7, 8:00 AM, Room 709/711
Chair: Ron Goldfarb, *National Institute of Standards and Technology, Boulder*

8:00 – 8:36 AM:
Y38.00001: Quantitative magnetic resonance imaging and phantom development,
Invited speaker: Kathryn Keenan

8:36 – 9:12 AM:
Y38.00002: Quantitative ultrasound: transition from the laboratory to the clinic
Invited speaker: Timothy Hall

9:12 – 9:48 AM:
Y38.00003: High resolution peripheral quantitative computed tomography for assessment of bone quality
Invited speaker: Galatea Kazakia

9:48 – 10:24 AM:
Y38.00004: Quantitative magnetic resonance thermometry and its use with MR-guided focused ultrasound
Invited speaker: Kim Pauly

10:24 – 11 AM:
Y38.00005: Development of traceable phantoms for improved image quantification in positron emission tomography
Invited speaker: Brian Zimmerman

FOCUS AND CONTRIBUTED SESSIONS (104 talks):

GIMS is organizing 3 focus sessions and 5 contributed sessions. See below for the room location of each session.

Session B24 Focus Session: Advances in Scanned Probe Microscopy I: Novel Approaches and Ultrasensitive Detection
Monday March 3, 11:15 AM Room: 504, 13 talks
Invited Speaker: Benoit Hackens

Session G24 Focus Session: Advances in Scanned Probe Microscopy II: High Frequencies and Optical Techniques
Tuesday March 4, 11:15 AM, Room 504, 13 talks
Chair: Sebastian Loth, *Max Plank Institute for Structure and Dynamics*
Invited Speaker: Vladimir Aksyuk

Session Q24: Novel Instrumentation and Measurements for Biomedical Research
Wednesday March 5, 2:30 PM, Room 504, 13 talks
Chair: Larry Nagahara, *Office of Physical Sciences - Oncology, National Cancer Institute*
Invited Speaker: Thomas Thundat

Session S24: Detectors, Sensors, and Transducers
Thursday March 6, 8:00 AM, Room 504, 14 talks
Chair: Rob Duncan, *University of Missouri*

Session T24 Focus Session: Advances in Scanned Probe Microscopy III: Scanning Probes Spectroscopic Techniques
Thursday March 6, 11:15 AM, Room: 504, 13 talks
Chair: Duming Zhang, *National Institute of Standards and Technology*
Invited Speaker: Tong Zhang

Session W24: Scattering and Diffraction

Thursday March 5, 2:30 PM, Room: 504,
14 talks
Chair: Yaohua Liu, *Argonne National
Laboratory*

Session Y24: Instrumentation and Measurements

Friday March 7, 8:00 AM, Room: 504, 12 talks

Session Z24: Neutron, Light, and X-ray Optics and Sources

Friday March 7, 11:15 AM, Room: 504,
12 talks
Chair: Ao Teng, *University of Tennessee*

V. GIMS Business Meeting

Tuesday, March 4, 5:45-6:45 Session K24
Room: 504

VI. Student Travel Awards

Reimbursement of travel expenses to the March meeting is available for student presenters at any GIMS sponsored session. Applications should be sent to the GIMS secretary-treasurer, Rachael Floyd, RFloyd@janis.com, before the meeting, and all travel receipts should be saved for subsequent submission to the APS for reimbursement. No applications have been received for the 2014 meeting so far, so please encourage any students presenting in a GIMS session to apply.

2013 Student Travel Award

None awarded.

VII. Next GIMS Election

An election for Vice-chair, Secretary-Treasurer and Members-at-large will soon be underway. Please be sure to vote!

VIII. Treasurer's Report

As of 11/30/13

Revenue	
Dues-APS	\$2790.00
March meeting share	\$4032.00
Allocated Investment Income	\$1610.05
Total Revenue	\$8432.05
Expenses	
Reception at business meeting	\$1830.00
Overnight mail	\$33.18
Travel and Grants	\$1578.47
Sorters meeting	\$0.00
Total Expenses	\$3441.65
Revenue-Expenses	\$4990.40

IX. Results of GIMS Election Held March 2013

For Vice-Chair:
Dennis Mills
(Argonne National Laboratory)

X. Current GIMS Governance

Past Chair: Wilhelmus Geerts (3/13-3/14)
Texas State University San Marcos

Chair: Albert Migliori (3/13-3/14)
Los Alamos National Laboratory

Chair-elect: Fedor Balakirev (3/13-3/14)
Los Alamos National Laboratory

Vice-chair: Dennis Mills (3/13-3/14)
Argonne National Laboratory

Secretary-Treasurer: Rachael Floyd
(3/11-3/14) *Janis Research Company*

Member-at-Large: Barry Zink (03/11-02/14)
University of Denver

Member-at-Large: Janos Kirz (3/11-02/14)
Lawrence Berkeley Nat. Lab

Member-at-Large: Terrence Jach
(03/11-02/14) *NIST*

Member-at-Large: Dan Johnstone
(03/11-02/14) *Semetrol, LLC*

Member-at-Large: Alain Diebold (3/12-3/15)
University at Albany

Member-at-Large: Veerle Keppens
(3/12-3/15) *University of Tennessee, Knoxville*

X1. Unit Convocation Report

The 2013 Unit Convocation was held in February 2013 and the GIMS group was represented by Fedor Balakirev and Rachael Floyd.

This meeting is an excellent opportunity to meet the leadership of other APS groups and of the APS itself. From the APS website: “The divisions, topical groups, forums, and sections play a vital role in the American Physical Society. Units aid the Society in fulfilling its mission to “advance and diffuse the knowledge of physics.” As part of a Society committed to member participation, the units provide opportunities for members to interact with colleagues with similar interests and to keep abreast of new developments in their specialized fields.”

The APS has substantial resources available to assist the units with their operations, including design and printing services and IT support. The unit handbook contains more details for those interested.

The APS Office of Public Affairs is a resource for those members wanting information on public policy, and can help those members who would like to be more involved in public affairs. They can assist with writing op-eds, or with information to use when contacting our congressperson, for example. Members attending the unit convocation were invited to spend a day visiting Capitol Hill and were provided with talking points and leave-behind packages to help make the visits worthwhile.

Strategic plan

The APS unveiled its 2013–2017 strategic plan at the 2012 Unit Convocation. Details of this plan can be found at: <http://www.aps.org/about/strategy>

We encourage everyone to review this strategic plan to see what APS has planned for the society moving forward.

GIMS
NEWSLETTER

AMERICAN PHYSICAL SOCIETY

Topical Group on Instrument and Measurement Science

One Physics Ellipse

College Park, MD 20740-3844
