

GFB Newsletter

September 2018

APS Topical Group on Few-Body Systems & Multiparticle Dynamics

OUR MISSION

To advocate, promote, and advance research on few-body systems in atomic, molecular, nuclear, particle, and mathematical physics.

DEAR GFB MEMBERS,

This newsletter summarizes the activities of the APS Topical Group on Few-Body Systems and Multiparticle Dynamics (GFB) over the past year. For general information, updates, and upcoming deadlines please visit our website at <https://www.aps.org/units/gfb> .

This year's highlight has been the awarding of the inaugural Faddeev Medal to **Vitaly Efimov** and **Rudolf Grimm** at the 22nd International Conference on Few-Body Problems in Physics, in Caen, France. You will find an article on this (with a picture of the awardees, spouses, and presenters) further below (thanks to Nasser Kalantar-Nayestanaki and Daniel Phillips for contributing this piece!). The next Faddeev Medal will be awarded at the 23rd International Few-Body Conference in Beijing, China in 2021.

The regular activities of GFB include seeking and recommending nominations for APS Fellowship. Newly minted APS Fellows will be announced later this year. GFB also suggests and sponsors invited sessions at the APS April and DAMOP meetings and we support student participation in these meetings through the Student Travel Award program. Information on the next cycle of this program can be found here: <http://jila.colorado.edu/~jpdincao/Site/GFB2019.html>. The deadline for applications is January 31, 2019.

As of April 2018, GFB had 343 members. We continued with our practice to offer one-year free membership to April and DAMOP meeting attendees, and more than 30 individuals took advantage of this opportunity this year. We welcome them to the Topical Group and hope they find their membership useful (and will renew it next year).

Every year the GFB Executive Committee composition changes and 2018 is no exception. I'd like to thank those who completed their terms in 2018 and left the Committee: **Ricardo Alarcon** served in the Chair-Line from 2014-2018, **Robert Forrey** and **Philip Johnson** served three-year terms as Executive Committee Members at Large, and **Charlotte Elster** served as our Secretary-Treasurer (for many years). Your efforts on behalf of GFB have been generous and vital! The Executive Committee has four new members: **Harald Griesshammer** has been elected Vice-Chair, **Wayne Polyzou** Secretary-Treasurer, and **Peter Schmelcher** and **Seth Rittenhouse** Executive Committee Members at Large. Welcome to the GFB leadership team!¹

We hope you enjoy reading this newsletter. If you have any questions/comments/suggestions, don't hesitate to let us know.

Tom Kirchner (Past Chair)
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¹ If you are interested in joining the GFB Executive Committee in the future, please get in touch.

Inaugural Faddeev Medal Awarded

by Nasser Kalantar-Nayestanaki (University of Groningen) and
Daniel Phillips (Ohio University, Athens)

On July 11, 2018 the inaugural Faddeev Medal was awarded at the 22nd International Conference on Few-body Problems in Physics, in Caen, France. The medal recognizes distinguished achievement in few-body physics. The winners are:

- **Vitaly Efimov:** "For the theoretical discovery of a series of weakly-bound three-body quantum states known as Efimov states."
- **Rudolf Grimm:** "In recognition of his ground-breaking experiments confirming the Efimov effect."

In addition to the medal itself, Efimov & Grimm also each received US\$1250 and a copy of the Ludwig Faddeev Memorial Volume, published by World Scientific. They engaged attendees at the conference with two delightfully different talks describing the paths that led them to their seminal results.

The Faddeev medal was inaugurated in 2016 by the European Research Committee on Few-Body Problems in Physics (ERCFBP) and the Topical Group on Few-Body Systems & Multiparticle Dynamics (GFB) of the American Physical Society. Springer, the publisher of the journal "Few-body Systems" provided generous support. It is awarded every three years to a scientist (or scientists) who advanced the field of few-body physics significantly – either through ground-breaking research or due to crucial progress achieved over the course of a career. An international panel of experts, chaired by Professor Giuseppina Orlandini (Trento) solicited nominations from the few-body community, and then selected Efimov & Grimm as the first Faddeev Medal recipients. The next Faddeev Medal will be awarded at the 23rd International Few-body Conference in Beijing, China.



Awardees, spouses, and presenters just after the ceremony. Left to right: Staszek Kistryn (Chair, ERCFBP); Giuseppina Orlandini (Chair, Selection Committee); Albina Shabelsky; Vitaly Efimov; Rudolf Grimm; Tatiana Shibaeva-Grimm; Daniel Phillips (Former Chair, GFB); Nasser Kalantar-Nayestanaki (Former Chair, ERCFBP). Photo credit: Nigel Orr.

APS APRIL MEETING

The APS April Meeting 2018 took place in Columbus, Ohio, from April 14 to 17. GFB co-sponsored two sessions:

Session C05 (with DNP): From QCD to the Deuteron (chaired by Dean Lee, Michigan State University) featured three invited talks:

Phiala Shanahan (MIT): [Lattice QCD and the Gluonic Structure of Light Nuclei](#)

Victor Mokeev (Jefferson Laboratory): [New Results on the Nucleon Resonance Spectrum and Structure from Photo- and Electroproduction Experiments](#)

Martha Constantinou (Temple University): [Lattice Generalized Parton Distributions and Form Factors of the Nucleon](#)

Session Y05 (with DNP): Weakly-Bound Systems (chaired by Kenneth Nollett, San Diego State University) featured three invited talks:

Peter Mueller (ANL): [Precision Measurements in Light, Weakly-Bound Nuclei](#)

Jordy de Vries (Nikhef): [Searches for Beyond-the-Standard-Model Physics with Light Nuclei](#)

Xilin Zhang (University of Washington): [Effective Field Theory for Halo Nuclei](#)

In addition, our 2017 APS Fellow Roxanne Springer (Duke University) gave a plenary talk on [Feynman's Footprints: Quantum Field Theory in Nuclear and Particle Physics](#) in the **Kavli Foundation Keynote Plenary Session: A Feynman Century (Session A01)**.

Two students presenting talks at April 2018 were supported through the GFB Student Travel Award program:

Daniel Odell (supervised by Lucas Platter at the University of Tennessee, Knoxville): [Renormalization of Inverse Power Law Potentials](#)

Hershdeep Singh (supervised by Roxanne Springer at Duke University): [Direct Detection of Dark matter as Three-Body Bound States](#)

Congratulations to Daniel and Hershdeep!

APS DAMOP MEETING

The 2018 Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (DAMOP) took place in Fort Lauderdale, Florida from May 28 to June 1. GFB co-sponsored two sessions:

Session D02: Ultracold State-to-State Chemistry (chaired by Mike Tarbutt, Imperial College London) featured four invited talks:

Tanya Zelevinsky (Columbia University): [Quantum-State-Controlled Photodissociation of Ultracold Diatomic Molecules](#)

Johannes Hecker-Denschlag (Universität Ulm): [State-to-State Chemistry for Three-Body Recombination in an Ultracold Rubidium Gas](#)

Ed Narevicius (Weizmann Institute): [Cold Chemistry with Cold Molecules](#)

Bas van de Meerakker (Radboud University): [Taming Molecular Collisions](#)

Session J02: Quantum Engineering with Ultracold Molecules (chaired by Kang-Kuen Ni, Harvard University) also featured four invited talks:

Sebastian Will (Columbia University): [Quantum Control of Ultracold Dipolar Molecules](#)

Goulven Quéméner (CNRS, Université Paris-Sud, ENS Paris-Saclay, Université Paris-Saclay): [Microwave Shielding of Ultracold Dipolar Molecules](#)

Dajun Wang (Chinese University of Hong Kong): [Collisions of Ultracold Ground-State NaRb Molecules](#)

Jun Ye (JILA): [A Fermi Degenerate Gas of Polar Molecules](#)

In addition, [Session A04: Few Body Physics](#) (chaired by Francis Robicheaux, Purdue University), which featured five contributed talks, had a distinctive GFB flavor.

One student presenter at DAMOP 2018 was supported through the GFB Student Travel Award program:

Jun Hui See Toh (supervised by Subhadeep Gupta at the University of Washington): [Photoassociation Spectroscopy and Atom-Molecule Coherence in Ultracold Li-Yb Mixtures](#)

Congratulations to Jun Hui!

MISCELLANEOUS

- The GFB leadership can submit nominations for the APS 2019 Beller and Marshak Lectureships. Each lectureship provides \$2,000 in travel support. To qualify, nominations must be for physicists living outside of the U.S. who have been invited to speak during a session at the APS March or April meeting. For more information, please consult:

[Beller Lectureship](#)

[Marshak Lectureship](#)

If you are interested in being nominated or know of a worthy nominee, please contact us. The deadline for nominations is November 1, 2018.

- Here is a full list of the current GFB leadership team (email addresses can be accessed at <https://www.aps.org/units/gfb/governance/officers/index.cfm>)

Chair: Dean Lee (04/18 - 05/19), Michigan State University

Chair-Elect: Jose D'Incao (04/18 - 05/19), University of Colorado, Boulder

Vice Chair: Harald Griesshammer (04/18 - 05/19), George Washington University

Past Chair: Tom Kirchner (04/18 - 05/19), York University

Secretary/Treasurer: Wayne Polyzou (04/18 - 05/21), University of Iowa

Member-at-Large: Kenneth Nollett (04/16 - 05/19), San Diego State University

Member-at-Large: Saori Pastore (04/16 - 05/19), Los Alamos National Laboratory

Member-at-Large: Wes Campbell (02/17 - 05/20), California State University, Los Angeles

Member-at-Large: William Detmold (02/17 - 05/20), Massachusetts Institute of Technology

Member-at-Large: Seth Rittenhouse (04/18 - 05/21), United States Naval Academy

Member-at-Large: Peter Schmelcher (04/18 - 05/21), University of Hamburg

- The recently modified bylaws of GFB can be found here: <https://www.aps.org/units/gfb/governance/bylaws.cfm>