

GFB Newsletter



Topical Group on Few-Body Systems & Multiparticle Dynamics

GFB

The APS Topical Group on Few-Body Systems and Multiparticle Dynamics (GFB), established in January 1985, brings together atomic, molecular, nuclear, particle, mathematical physicists, and quantum chemists to investigate the dynamics of few-body systems. These systems offer valuable insights into few-body dynamics and emerging properties across different physics areas, revealing common features across various sub-disciplines. As an interdisciplinary group, many GFB-sponsored sessions at APS meetings are organized in collaboration with other Groups and Divisions, focusing on specific themes from diverse fields.

Chair: Gordon Drake

Chair-Elect: Sebastian Koenig

Vice-Chair: Jesus Pérez-Ríos

Treasurer: Anna McCoy

Past-Chair: Saori Pastore

Members-at-Large: Nir Barnea, Chris Ticknor, Takuma Yamashika, Janine Shertzer, Alex Gnech

Early Career

Members-at-Large: Aaron Bondy, Jane Kim

Email: gfbexec@aps.org

Dear GFB Members,

The purpose of this GFB Newsletter is to bring you up to date on the exciting activities of the past year.

The GFB plays a pivotal role bridging the worlds of atomic/molecular physics and nuclear physics. A combination of theory and high-precision measurements for few-body systems plays a key role in searches for new physics beyond the standard model, as well as probing properties of the nucleus and testing nuclear models. The main mission of the GFB is to promote these areas of research, and provide a forum for their discussion and dissemination. This naturally brings us into contact with the Division of Nuclear Physics (DNP) and the Division of Atomic, Molecular, and Optical Physics (DAMOP) for joint activities, as further discussed in this Newsletter.

Our current GFB membership stands at 344 members, up substantially from 308 last year. We would like to thank you all for your ongoing contributions. Your support is *essential*, and we encourage you to renew your membership and continue backing the GFB. As you know, the number of members directly impacts the resources allocated to the GFB. We are using these funds primarily to support junior scientists through travel awards, and through the newly established GFB Dissertation Award. Your contribution is extremely valuable.

The activities of the GFB can be divided into two main groups: (i) selection of winners for our various prizes and awards, and (ii) organization of sessions of invited and contributed papers for the Global Physics Summit. These two areas are discussed further in the following sections. In brief, this year marks the inaugural award of the GFB Dissertation award. We are pleased to announce that this year, the award was split between the two winners **Aaron Bondy** "*For advances in the application of pseudospectral methods to beta decay, two-photon decay, and tune-out frequencies in helium*" and **XinCheng Lin** "*For advances in the development of effective field theories for nuclear and atomic few-body systems and for exploring the role of symmetries in describing low-energy nuclear*

Webpage

Bylaws

APS Fellowship Committee:

Jesus Pérez-Ríos (Chair), Sebastian Koenig, Christian Forssén, Hossein Sadeghdpour, Jose D'Incao

Nominating Committee:

Saori Pastore (Chair), Alex Gnech, Jane Kim, Anna McCoy, Mark Caprio

Election Coordinator:

Anna McCoy

Travel Award Committee:

Gordon Drake (Chair), Sebastian Koenig, and Jesus Pérez-Ríos

Program Committee:

Sebastian Koenig (Chair), Chris Ticknor, Nir Barnea

GFB Dissertation Committee:

Saori Pastore and Sebastian Koenig (Co-Chairs), Janine Shertzer, Alex Gnech

Communications Committee:

Jesus Pérez-Ríos (Chair), Aaron Bondy, Chris Ticknor, Sebastian Koenig, Takuma Yamashita

capture reactions." In addition, **Zong-Chao Yan** was named an APS Fellow "for pioneering contributions to high-precision calculations of few-body atomic systems, enabling the determination of nuclear properties such as the charge radius of the halo nucleus of isotope 11 of lithium. " We are especially pleased to be able to support junior scientists through the GFB Travel Awards, which allow them to present their work at APS meetings. The 2025 recipients of the award are **Suman Aich** and **Graham Chambers**. Congratulations to them from the GFB! We look forward to hearing more from these talented junior scientists.

Finally, we invite you to join us at the upcoming **2026 Global Physics Summit** and enjoy the GFB sponsored sessions. Stop by our GFB table to say hello and grab a little GFB swag. We also encourage you to submit nominations for APS Fellows and GFB Travel Awards, and, especially, take the time to nominate outstanding junior researchers: our future!

Thank you for your continued support, and we look forward to another productive year together.

Warm regards,
The Topical Group on Few-Body Systems and Multiparticle Dynamics Executive Committee

GFB Awards

GFB Travel Award: 2025 Recipients



Suman Aich, is currently a Physics graduate student at Indiana University, Bloomington, Indiana, working under the supervision of Prof. Babak Seradjeh. Prior to joining Indiana University, he completed an undergraduate degree in Engineering Physics at the Indian Institute of Technology – Banaras Hindu University (IIT-BHU), India. His research broadly lies at the interface of theoretical condensed matter and

AMO physics. Specifically, he focuses on low-dimensional topological quantum materials, light-matter interactions and quantum dynamics in nonequilibrium systems as well as quantum many-body physics simulation in AMO systems.



Graham Chambers is a fourth year PhD student at Washington University in St. Louis working on electroweak nuclear physics. One strategy to search for beyond the Standard Model (BSM) physics is to make very precise measurements on observables for which the SM background is well known and look for deviations from predictions. However, interpreting these

experiments requires nuclear theory in order to disentangle known physics from possible signs of new physics. He uses quantum Monte Carlo methods and chiral effective field theory to perform these kinds of calculations, applied to processes such as neutrinoless double beta decay, superallowed beta decay, and lepton-nucleus scattering.

2024 Faddeev Medal Recipient

The [Faddeev Medal](#), established in 2016 by the APS Topical Group on Few-Body Systems & Multiparticle Dynamics (GFB) and the European Research Committee on Few-Body Problems in Physics (ERCFBP), honors exceptional achievements in Few-Body Physics. This prestigious medal, co-sponsored by the journal *Few-Body Systems*, is named after Ludwig Faddeev, a pioneer in the field.

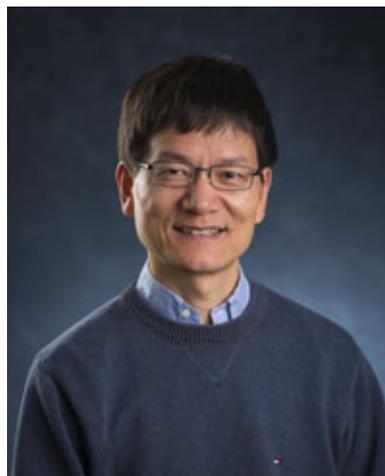
The 2024 recipient of the Faddeev Medal was Professor Henryk Witała for his lifetime contributions to few-nucleon physics. His work, particularly on solving the continuum Faddeev equations with realistic nuclear forces, has significantly advanced our understanding of three-nucleon dynamics.



Professor Witała's groundbreaking research has shaped theoretical frameworks for nuclear physics, enabling a deeper understanding of three-nucleon forces and polarization phenomena. His contributions continue to drive experimental efforts and have played a pivotal role in the development of modern nuclear theory.

The Faddeev Medal includes a \$2500 award and a medal. It will next be awarded in 2026.

2025 APS Fellow



Zong-Chao Yan for pioneering contributions to high-precision calculations of few-body atomic systems, enabling the determination of nuclear properties such as the charge radius of the halo nucleus of isotope 11 of lithium.

Zong-Chao Yan is a Professor of Physics at the University of New Brunswick, Canada. He has dedicated over 35 years to high-precision calculations of few-body atomic and molecular systems, making foundational contributions to the field. He revolutionized the theoretical treatment of atomic lithium, establishing benchmarks that have guided both theory and experiment. Working with an experimental team at GSI in Germany, he played a key role in the first determination of the nuclear charge radius of the halo nucleus Li-11 —marking a major milestone in the study of exotic nuclei and few-body quantum systems. More recently, Yan and his group have resolved long-standing

discrepancies in the dissociation energy of the hydrogen molecule. These breakthroughs have substantially improved the agreement between theory and experiment, strengthening the role of atomic physics as a precise probe of fundamental constants and nuclear structure. His results have attracted widespread attention within the precision measurement community.

GFB Dissertation Award

Thanks to an initiative launched under the leadership of our past Chair, Saori Pastore, the **GFB Dissertation Award** was launched in 2025 and is now being awarded for the first time in 2026.

The GFB Dissertation Award honors outstanding early-career scientists who have made significant contributions through original research in Few-Body Systems & Multiparticle Dynamics. Presented biannually by the APS GFB, this prestigious award aims to recognize excellence in the field and encourage further innovative research.

The award includes a \$1,500 stipend, along with up to \$1,000 in travel reimbursement. The recipient will also receive a registration waiver for the Global Physics Summit and an invitation to deliver an invited talk at the GFB-sponsored session during the Summit.

This award is open to early-career scientists who have completed their Ph.D. in experimental or theoretical nuclear or atomic physics within the last five years.

In this inaugural year, two nominees were tied for first place, and so the cash award is being split between the two winners, with both receiving the travel reimbursement to attend the Global Physics Summit and present an invited talk. The winners are:



Aaron Bondy University of Windsor, 2024 for his dissertation entitled *Application of Pseudospectral Methods to Beta Decay, Two-photon Decay, and Tune-out Frequencies in Helium*. (G. Drake, supervisor). Citation: "For advances in the application of pseudospectral methods to beta decay, two-photon decay, and tune-out frequencies in helium"

The dissertation is divided into three distinct parts, showing the range and versatility of pseudospectral methods to represent the complete spectrum of bound and continuum states with finite basis sets. The first part considers the beta decay of helium-6, and the shake-up and shake-off processes that it initiates, with implications for low-energy tests of the Standard Model. The second part treats spontaneous two-photon decay in heliumlike ions, including finite-nuclear-mass effects and uncovers new algebraic relations from gauge invariance connecting them. The third part calculates the tune-out frequency of metastable helium via a reformulation of the problem as a zero in Rayleigh scattering cross section, rather than the frequency-dependent polarizability, and including retardation effects. A comparison with experiment provides a novel QED test independent of traditional energy level

measurements such as the Lamb shift.

Aaron currently has a postdoctoral position at Drake University with the group of Klaus Bartschat.



Xincheng Lin, Duke University, 2024 for his dissertation entitled *Effective Field Theory and Approximate Symmetries for Low-Energy Few-Body Systems* (supervisor Roxanne Springer). Citation: "For advances in the development of effective field theories for nuclear and atomic few-body systems and for exploring the role of symmetries in describing low-energy nuclear capture reactions."

His thesis uses effective field theories with short-range interactions (SREFTs) to study few-body systems. The role of approximate symmetries, including the Wigner-SU(4) symmetry, large- N_c (number of colors in QCD) expansion, and discrete scaling symmetry, are also discussed in the context of SREFTs. In addition, his work demonstrates how these approximate symmetries may provide insights into few-body observables by analyzing their constraints on observables such as cold neutron-deuteron capture, dark matter scattering off light nuclei, and universal relations in four-body systems. Through this work, he seeks to understand how symmetry and separation of scales constrain few-body physics. More recently, he has also begun exploring how insights from few-body physics can inform quantum simulation of many-body systems.

Xincheng is currently a postdoctoral researcher in the nuclear theory group at North Carolina State University

Meetings

2026 APS Annual Leadership Meeting

The APS Annual Leadership Meeting (ALM), held at the Grand Hyatt Washington in Washington, D.C., from February 4-6, 2026, brought together leaders from the American Physical Society and the scientific community to enhance their leadership skills, network, and shape the future of physics.

The APS meetings often feature invited sessions co-sponsored by the APS Topical Group on Few-Body Systems & Multiparticle Dynamics (GFB) and the Division of Nuclear Physics (DNP). These sessions highlight the close collaboration between GFB and DNP, advancing the shared goals of the physics community.

Upcoming events

2026 Global Physics Summit

The [2026 APS Global Physics Summit](#) is the largest physics research conference in the world, uniting 14,000 scientific community members across all disciplines of physics. This meeting reflects the inclusivity and synergy of many physics disciplines and emerging cross-disciplinary areas of science, which perfectly reflects this year's theme of Science for a Shared Future. The meeting will take place from March 16–21, 2026, in Denver, CO.

The GFB is excited to [sponsor two invited sessions in collaboration with the Division of Nuclear Physics \(DNP\). Plus we will be hosting a GFB focus session and an invited session.](#) These sessions are a great opportunity for attendees to connect, share research, and discuss exciting new ideas in the world of physics. Two of the sessions will feature invited talks by the GFB Dissertation Award winners [Aaron Bondy](#) and [Xincheng Lin](#).

We can't wait to see you there!

GFB Elections!

The GFB is now accepting nominations for the positions of Vice-Chair, Member-at-Large, and Early Career Members. If you would like to nominate someone (or yourself), please send the nominee's contact info, affiliation, and a brief nomination statement to gfbexec@aps.org.

We look forward to your nominations!

APS Fellow Call for Nominations

The GFB is calling for nominations for the [APS Fellowships](#). APS Fellows are selected based on their outstanding contributions to physics through research, teaching, leadership, or service to the physics community. Fellowship nominations are a recognition by professional peers for their significant advances in physics. An official call will follow through the GFB emailing systems. The deadline for application is June 2nd, 2026.

Memberships

The annual membership fee for GFB is just \$10 and will be waived for those renewing their GFB membership. To take advantage of this, [simply log into your APS account](#) and apply the coupon code **JOINGFB2026** at checkout when adding GFB as a unit.

For additional information please check our [webpage](#) and/or send an email to gfbexec@aps.org.