

Dear GFB Members,

It is with great pleasure that I'm putting this Newsletter together.

Few-body physics continues to thrive and continues to bridge seemingly disconnected areas. A nice example is the Efimov effect and physics related to it. Pioneered by nuclear physicist Vitaly Efimov in the 70s, the three-body Efimov effect has captured the imagination of atomic, molecular, nuclear and particle physicists alike. Extensions to the four- and five-body, and even N-body, sector have been pursued. Implications of Efimov physics for many-body phase diagrams have been studied at zero and finite temperature. And most recently, the discrete scale invariance has been probed experimentally, confirming the predicted geometric spacing for three consecutive Efimov resonances using ultracold atomic gases.

This is just one of many cutting edge examples, where few-body physics has made and continues to make important contributions. Few-body studies of the Hoyle state are intimately related to "life as we know it", as the Hoyle state plays a key role in the production of carbon through the fusion of three alpha particles in red giant stars. Studies of the three-body contribution to the nuclear force continue to be at the forefront of understanding the fundamental forces. Understanding intermolecular Coulombic decay processes in molecular dimers is not only of fundamental interest but bears implications on DNA damage induced by ionizing radiation and improved cancer radiation therapy techniques. Dipole-dipole bound Rydberg atoms reveal rich physics, ranging from the prediction of new three-body states to quantum computation applications. And, and, and...

This Newsletter contains exciting news:

You'll find a brief summary on the upcoming GFB elections - a big "thank you" to those who agreed to stand for election!

You'll find a list of recently elected APS Fellows - congratulations to Nasser Kalantar-Nayestanaki and Silas Beane, who were sponsored by the GFB!

You'll also find a brief write-up of the GFB travel award program. Many thanks to Daniel Phillips for getting this going!

The GFB will be represented in invited and contributed sessions in the upcoming April Meeting - please see below for details.

Congratulations to Ulf-G. Meissner, who received the 2014 Beller Lectureship and who will be giving one of the invited talks at the April Meeting (see below for more details).

Mark your calendar: The 21st International Conference on Few-body Problems in Physics (FB21) will take place in Chicago, IL from May 18-22, 2015.

Finally, I would like to express my sincere thanks to Hossein Sadeghpour, who served in the Chair line from 2010-2013, and to Werner Boeglin and Pieter Maris for their service on the Executive Committee. I also sincerely thank the current GFB leadership team for all their work.

With kind regards,

Doerte Blume
Chair, GFB Topical Group

RECENT APS FELLOWS ELECTED THROUGH GFB

Congratulations to the recently elected APS Fellows Nasser Kalantar-Nayestanaki and Silas Beane!!!

Nasser Kalantar-Nayestanaki [2013], University of Groningen

Citation: "For leading a comprehensive experimental program on few-nucleon reactions that unveiled new effects of two- and three-body forces."

Silas Beane [2012], University of New Hampshire

Citation: "For advancing the understanding of few-hadron systems from Quantum Chromodynamics by pioneering the application of effective field theories and lattice calculations of the QCD path integral to these systems."

see <http://www.aps.org/programs/honors/fellowships/>

The next deadline for nominations for APS Fellowship through GFB is 06/02/2014. Please contact Chris Ticknor at cticknor@lanl.gov if you have any questions regarding the nomination process.

GFB TRAVEL AWARD

The GFB travel award for students and postdocs was established in 2013 to help defray expenses associated with the April and DAMOP meetings. The GFB award is typically announced in early January through the GFB mailing list.

The 2014 award recipients are (selection committee Chris Ticknor, Chair, and Daniel Phillips):

Kevin Daily (DAMOP), First-year postdoc, Purdue: "Ps-Ps scattering via the correlated Gaussian hyperspherical method"

X. Y. Yin (DAMOP), graduate student, Washington State: "Harmonically trapped two-atom systems: Interplay of short-range s-wave interaction and spin-orbit coupling"

The 2013 award recipients are (selection committee Daniel Phillips, Chair, and Agnieszka Jaron-Becker):

Sourav Dutta (DAMOP), Ph.D. student, Purdue: "Collision induced losses in a dual-species magneto-optical trap of Lithium and Rubidium"

Georgios Laskaris (April), Ph.D. student, Duke: "Three-body photodisintegration of ^3He using a longitudinally polarized target and a circularly polarized $\text{CE}\geq$ beam at 12.8 and 14.7 MeV"

Arghavan Safavi-Naini (DAMOP), Ph.D. student, MIT/Harvard: "Non-universal bound states of two identical fermions and one light particle"

Micah Schuster (April), Ph.D. student, San Diego State: "Ab initio many-body calculations of the ^4He photo-absorption cross section"

Patrick Zabawa (DAMOP), First-year postdoc, Oklahoma: "Progress Toward Coupling a Sample of Collectively Excited Atoms to a High Finesse Cavity"

Congratulations to these young creative minds!

GFB AT THE APRIL MEETING 2014

Invited Session R11: Precision Big-Bang Nucleosynthesis (GFB/DAP)

This session will address two recent developments that suggest a concordance in the BBN data we have may be emerging. In particular, the cosmological lithium problem may be less severe than previously thought, and measurements of primordial D/H are achieving unprecedented levels of accuracy. All of this opens up the possibility to use BBN as a precise tool to address questions such as the ranges of standard-model parameters, which generate the observed primordial abundances.

Chair: Kenneth Nollett (Ohio University)

Ryan Cooke (UC Santa Cruz), "Primordial deuterium at the per cent level"

Brian Fields (Illinois), "A bitter Pill: The Lithium Problem"

Ulf-G. Meissner (Bonn), "Quark mass variations of nuclear forces, BBN, and all that"

Invited Session E10: Light Baryons as Few-Body Systems (GFB/GHP)

This session will explore the extent to which the proton, and excited states thereof, can be described as few-body systems. The traditional picture of the proton is that it is made of three quarks, but over the past thirty years we have learnt that many aspects of proton structure are properly described only by strongly-interacting many-body dynamics that includes gluons and sea quarks. In this session each of the speakers will address the connection between the many-body and few-body pictures of this most basic of hadrons, and attempt to elucidate circumstances under which proton structure can be represented in terms of a few effective degrees of freedom.

Chair: Martin Savage (University of Washington)

Ian Cloet (Argonne National Laboratory), "Nucleon and Delta structure in continuum QCD"

Volker Burkert (Jefferson Lab), "What Nucleon Resonances Teach Us About Nucleon Structure"

Christian Weiss (Thomas Jefferson National Accelerator Facility), "Nucleon Structure on the Light-Front"

GFB is also co-sponsoring the following Invited Sessions:

Invited Session J3: Chromo-dynamics (GHP and GFB);

Invited Session K2: Quarkonium, XYZ states (GHP and DPF and GFB);

Invited Session B3: Hadron polarizabilities (DNP and GFB);

Invited Session M3: Orbiting quarks (DNP and GFB).

Session M7 will contain Contributed Talks on the subject of few-body Physics.

MARK YOUR CALENDAR

The 21st International Conference on Few-body Problems in Physics (FB21) will take place in Chicago, IL from May 18-22, 2015. It will be jointly organized by Argonne National Laboratory and Ohio University. This series of conferences has a long tradition, that dates back to 1959. The most recent (FB20) was held in 2012 in Fukuoka, Japan. The meeting will discuss problems that can be understood in terms of a few effective degrees of freedom in areas including, but not limited to: atomic and molecular physics, few-nucleon systems, hadronic physics, and cluster models of heavier nuclei. The program will thus reflect the broad scope and inter-connectedness of contemporary few-body physics, and will give due representation to both experiment and theory in these areas.

UPCOMING GFB ELECTIONS

This year's openings are for the Vice-Chair (one position) and the Executive Committee (two positions).

The candidates for the Vice-Chair position are:

Ricardo Alarcon, Arizona State University
Charles Hyde, Old Dominion University

The candidates for the Executive Committee positions are:

Mohammad Ahmed, North Carolina Central University
Klaus Bartschat, Drake University
Matthias Schindler, University of South Carolina
Thorsten Weber, LBNL

A big "thank you" to these individuals for agreeing to serve the GFB community! Many thanks also to the Nominating Committee (Calvin Howell, Chair, Gerald Feldman, Agnieszka Jaron-Becker, Wolfgang Korsch and Charles Weatherford)!

An email announcement with the voting details, including a link to biographical information and the candidates' statement, will go out shortly to all GFB members. When you receive the email, please take a few minutes to cast your vote.

THE CURRENT LEADERSHIP TEAM OF THE GFB

see <http://www.phy.ohiou.edu/~gfb/>

Chair:
Doerte Blume, Washington State University
<doerte@wsu.edu>

Chair-Elect:
Daniel Phillips, Ohio University
<phillid1@ohio.edu>

Vice-Chair:
Christopher Ticknor, Los Alamos National Laboratory
<cticknor@lanl.gov>

Past Chair:
Calvin Howell, Duke University, TUNL and Duke FEL Lab
<howell@tunl.duke.edu>

Secretary Treasurer:
Charlotte Elster, Ohio University
<elster@ohiou.edu>

Executive Committee:

Wolfgang Korsch [2014], University of Kentucky
<korsch@pa.uky.edu>

Dean Lee [2014], North Carolina State University
<dean_lee@ncsu.edu>

Agnieszka Jaron-Becker [2015], JILA
<jaron@jila.colorado.edu>

Michael Schulz [2015], Missouri University of Science and Technology
<schulz@mst.edu>

Sonia Bacca [2016], TRIUMF
<bacca@triumf.ca>

Gerald Feldman [2016], The George Washington University
<feldman@gwu.edu>