

# WORKSHOP PROGRAM, May 12-16,2014

## *“Few-body Universality in Atomic and Nuclear Physics: Recent Experimental and Theoretical Advances”*

Organizers: Doerte Blume, Daniel Phillips, Francesca Ferlaino,  
and Chris H. Greene.

All talks (but the colloquium) are in C520.  
Colloquium on late Monday afternoon is held in PAA A-102.

In depth talk: 35min. talk + 10min. discussion.  
Hot topics/research updates: 20min. talk + 5min. discussion.

### **Monday, May 12**

Starting at 8am: Registration (INT office, C411)

MORNING SESSION (Session Chair: Daniel Phillips, Ohio University)

8.45am: Welcome by David Kaplan, Director of the INT.  
Welcome by Daniel Phillips (for the workshop organizers).

9-9.45am: Randy Hulet, Rice University  
Finite range corrections near a Feshbach resonance and their  
role in the Efimov effect

9.45-10.30am: Alejandro Kievsky, INFN, Pisa  
Selected topics in three- and four-nucleon systems

10.30-11am: Coffee break (refreshments provided)

11-11.45am: Ania Kwiatkowski, TRIUMF  
Benchmarks from high-precision mass measurements at  
TITAN

11.45-12.30pm: Li You, Tsinghua University  
Ultracold collisions in the presence of spin-orbit coupling

12.30-2.30pm: Lunch break  
(participants make their own arrangements; there are many  
small restaurants within 10 minute walking distance (many  
participants are familiar with the area))

## **Monday, May 12, continued**

AFTERNOON SESSION (Session Chair: Hans-Werner Hammer, University Darmstadt)

- 2.30-2.55pm: Deep Gupta, University of Washington  
Strongly interacting regimes in the Lithium-Ytterbium system
- 2.55-3.20pm: Hui Zhai, Tsinghua University  
Few-Body Problems in Spin-Orbit Coupled Cold Atom System
- 3.20-3.50pm: Coffee break (refreshments provided)
- 4.00-5.00pm: Debbie Jin, JILA/NIST  
Physics colloquium  
Universal Dynamics of a Degenerate Unitary Bose Gas

## **Tuesday, May 13**

MORNING SESSION (Session Chair: Gautam Rupak, Mississippi State University):

- 9-9.45am: Rudi Grimm, Innsbruck  
Efimov and beyond: New twists in few-body physics with ultracold bosons and fermions
- 9.45-10.30am: Mario Gattobigio, CNRS  
Universality and Scaling in Shallow Bound States
- 10.30-11am: Coffee break (refreshments provided)
- 11-11.45am: Christophe Salomon, ENS  
A Mixture of Bose and Fermi Superfluids
- 11.45-12.30pm: Yusuke Nishida, Tokyo Institute of Technology  
Few-body universality: from Efimov effect to super Efimov effect
- 12.30-2.30pm: Lunch break

## **Tuesday, May 13, continued**

AFTERNOON SESSION (Session Chair: Hui Zhai, Tsinghua University):

- 2.30-2.55pm: Colin Parker, University of Chicago  
Geometric scaling of three-body collision resonances for a Li-Cs mixture in the Efimov scenario
- 2.55-3.20pm: Eva Kuhnle, University Heidelberg  
Observation of Efimov Resonances in a Mixture with Extreme Mass Imbalance
- 3.20-3.50pm: Coffee break (refreshments provided)
- 3.50-4.35pm: Rituparna Kanungo, TRIUMF  
Exotic properties of halo nuclei investigated through direct reactions

## **Wednesday, May 14**

MORNING SESSION (Session Chair: Masahito Ueda, University of Tokyo):

- 8.45-9.30am: John Thomas, North Carolina State University  
Measuring scale invariance and viscosity in Fermi gases
- 9.30-10.15am: Takashi Nakamura, Tokyo Institute of Technology  
Weakly-bound and unbound few-body nucleonic systems
- 10.15-10.40am: Charlotte Elster, Ohio University  
The Coulomb problem in momentum space without screening
- 10.40-11.10am: Coffee break (refreshments provided)
- 11.10-11.55am: Chen Ji, TRIUMF  
From cold atoms to halo nuclei: an EFT description of three-body physics
- 11.55-12.40pm: Reinhard Doerner, University Frankfurt  
Imaging the wave functions of He<sub>2</sub>, He<sub>3</sub> and the He<sub>3</sub> Efimov state

Afternoon free for discussions.

- 6.30pm: Conference dinner (see handout for details)

## **Thursday, May 15**

MORNING SESSION (Session Chair: Chris Greene, Purdue University):

- 9-9.45am: Johannes Hecker Denschlag, Universitaet Ulm  
Cold three-body collisions between atoms and ions
- 9.45-10.30am: Amy Nicholson, University of Maryland  
Universality from a lattice
- 10.30-11am: Coffee break (refreshments provided)
- 11-11.45am: Emiko Hiyama, RIKEN  
Three- and four-body calculations of  $^3\text{He}$  and  $^4\text{He}$  atomic systems and structure of light hypernuclei
- 11.45-12.30pm: Shimpei Endo, University of Tokyo  
Perfect screening of the Efimov effect by the dense Fermi sea
- 12.30-2.30pm: Lunch break

AFTERNOON SESSION (Session Chair: Fei Zhou, University of British Columbia):

- 2.30-2.55pm: Lev Khaykovich, Bar Ilan University  
Three-body recombination at vanishing scattering length
- 2.55-3.20pm: Jan Martin Pawłowski, University of Heidelberg  
Equation of state and phase structure of ultracold quantum gases in 2 & 3 dimensions
- 3.20-3.50pm: Coffee break (refreshments provided)
- 3.50-4.35pm: Chris Ticknor, Los Alamos  
2D dipolar scattering with a tilt

**Friday, May 16**

MORNING SESSION (Session Chair: Doerte Blume, Washington State University):

- 8.45-9.30am: Dmitry Petrov, CNRS and Universite Paris-Sud  
Multi-body interacting bosons
- 9.30-10.15am: Thomas Lompe, MIT  
From Few to Many: Engineering Quantum Systems one Atom at a Time
- 10.15-10.40am: Yvan Castin, LKB-ENS, Paris  
At the threshold of the Efimov effect
- 10.40-11.10am: Coffee break (refreshments provided)
- 11.10-11.55am: Yujun Wang, Kansas State University  
Predictive three-body physics for ultracold atoms --- the role of van der Waals interactions
- 11.55-12.20pm: Dean Lee, North Carolina State University  
Adiabatic projection method for lattice scattering and reactions

Closing of workshop.