



Building a Quantum Society: Singles, Pairs, Trimers and even more

Recently, ultracold atomic and molecular gases emerged as an ideal playground to study and emulate a variety of systems from condensed matter to nuclear physics. In many quantum phenomena, the interaction between particles plays a fundamental role, acting as a binding agent and determining the “social” structure of particle ensembles. Remarkably, in ultracold gases the interaction can be externally controlled almost at will.

I will discuss some of our recent experiments based on the two types of interaction available in ultracold gases: the contact (short-range) and dipolar (long-range) interaction. As an example of resonant contact interaction, I will tell the story of a young Russian nuclear physicist, Vitaly Efimov, who in 1970 proposed the existence of a geometric series of “giant” trimer states as a solution to the quantum three-body problem. I will tell how his predictions, first received with skepticism, have been demonstrated in experiments. After three decades of searching in various systems, Efimov’s ideas have come to life in tunable ultracold gases; first in Innsbruck and then in many other labs around the world. Regarding dipolar interaction, I will report on the first achievement of a Bose-Einstein condensate of strongly magnetic erbium atoms and on its spectacular dipolar-mediated collapse.

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Einladung
 zur Antrittsvorlesung

**Building a Quantum Society:
Singles, Pairs, Trimers and even more**

von
Univ.-Prof. Dr. Francesca Ferlaino

Dienstag, 22. Jänner 2013 17:15 Uhr
 Hörsaal C, Viktor Franz Hess Haus
 Technikerstr. 25

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Programm:

Begrüßung und Vorstellung
durch den Dekan der Fakultät für Mathematik, Informatik und Physik
Univ.-Prof. Dr. Alexander Ostermann

Grußworte des Rektors
Univ.-Prof. Dr. Dr. h.c. mult. Tilmann Märk

Im Anschluss laden wir zu einem kleinen Buffet ein.
Wir freuen uns auf Ihr Kommen.

Francesca Ferlaino



Photo J-F Dars

Francesca Ferlaino was born in 1977 in Naples, Italy. There, she studied physics before moving to Trieste for her theoretical diploma work on Bose-Einstein condensates at the International School for Advanced Studies (SISSA). For her doctoral studies, Francesca switched to experimental physics and worked in the group of Prof. M. Inguscio at the European Laboratory for Non-linear Spectroscopy

(LENS) in Florence. She received her PhD degree in 2004 on the subject of "Fermi gases in optical lattices" and she later prolonged her stay in Florence for two post-doctoral years. From 2006 on, she joined the group of Prof. R. Grimm in Innsbruck to work on ultracold quantum gases with the main emphasis on few-body and dipolar physics. Francesca is now professor for experimental physics at the University of Innsbruck and she leads the ERBIUM research team within the Ultracold Atoms and Quantum Gases group.

Francesca Ferlaino was awarded numerous prizes and fellowships, e.g. a Lise-Meitner postdoctoral fellowship in 2007, a START prize grant in 2009, an ERC "starter" prize grant in 2010, the Kohlrausch Prize (ÖPG) in 2010, the Preis der Landeshauptstadt Innsbruck in 2011, and the AIDDA Prize for Women in Science.