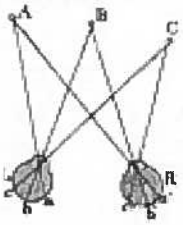

WEEKLY CALENDAR

Department of Physics and Astronomy
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Baton Rouge,, Louisiana 70803-4001

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February 5, 2007

Max Goodrich Distinguished Lecture Series

"Einstein's Legacy in Low Temperature Physics: Superfluids and Supersolids"

5:00PM / Wednesday, 7 February 2007 / Room 130

[A reception at the LSU Faculty Club will follow the lecture]

Host: Dr. Jorge Pullin

Moses H.W. Chan, Ph.D.

Pennsylvania State University

Einstein, building on the idea of Satyendra Bose, made the remarkable prediction that a collection of certain of particles, known as bosons, will at sufficiently low temperature lose their individual identities and behaves as one giant 'atom'. This transformation, known as Bose-Einstein condensation, was observed in liquid helium nearly 70 years ago and in the vapor phase 10 years ago. Below 2.176K, liquid helium becomes a frictionless superfluid with a multitude of amazing properties, not imagined even by Einstein. Even more extraordinarily, solid helium was recently found (1-4) in the laboratory to show the same amazing properties- it becomes what is now known as a 'supersolid' ie, a solid which can flow like a superfluid, without any resistance, through even atomic-size holes. This public lecture will explain in simple terms how such incredible behavior is possible.

1. E. Kim and M.H.W. Chan, Nature 427, 225 (2004).
2. E. Kim and M.H.W. Chan, Science 305, 1941 (2004).
3. E. Kim and M.H.W. Chan, J. Low Temperature Physics 138, 859 (2005).
4. E. Kim and M.H.W. Chan, Physical Review Letters 97, 115302 (2006).

Photo showing fountain effect in liquid helium (left), torsional oscillator used for the study of solid helium, and BEC in alkali gasas (right).

General Seminar

"Critical Casimir Forces"

3:40PM / Thursday, 8 February 2007 / Room 109

[Refreshments served at 3:15 PM in Room 229 Nicholson]

Host: Dr. Jorge Pullin

Moses H.W. Chan Ph.D.

Pennsylvania State University

One of the most beautiful aspects of physics is how phenomena in widely different systems are described by the same mathematical formulation. In electromagnetism, the Casimir force is due to the confinement of zero-point electromagnetic fluctuations between two conducting plates a finite distance apart. In a completely analogous way, the confinement of critical fluctuation in an adsorbed film leads a thickness dependence correction to the free energy of the film and, therefore a critical Casimir force between the interfaces of the film. The existence of the critical Casimir force was confirmed by measuring the thickness of He-4 film adsorbed on solid substrates as the system is brought through the superfluid , or lambda ,transition. A thinning of the adsorbed film driven by the attractive force between the liquid-vapor and the liquid-copper interface is found (1, 2). A repulsive critical Casimir force near the He-3-He-4 tricritical point was also found (3).

1. R. Garcia and M.H.W. Chan, Physical Review Letters 83,1187 (1999).
2. A. Ganshin, S. Scheidemantel, R. Garcia and M.H.W. Chan, Physical Review Letters 97, 075301 (2006).
3. R. Garcia and M.H.W. Chan, Physical Review Letters 88, 086101 (2002).

Photo showing fountain effect in liquid helium (left), torsional oscillator used for the study of solid helium, and BEC in alkali gasas (right).

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Special Seminar

"TBA"

3:40PM / Tuesday, 13 February 2007 / Room 109 Nicholson

Host: Dr. John DiTusa

Daniel Sheehy, Ph.D.

Iowa State University

Reminder:

There will be a faculty meeting on Tuesday, February 6, 2007 at 3:15 p.m. in Room 109 Nicholson.

Congratulations To

Dr. Kristina Launey on her promotion to Senior Postdoctoral Researcher.

Publications:

"Instability of charged and rotating naked singularities," Gustavo Dotti, Reinaldo J. Gleiser and **Jorge Pullin**, Physics Letters B 644 (2007) 289-293.