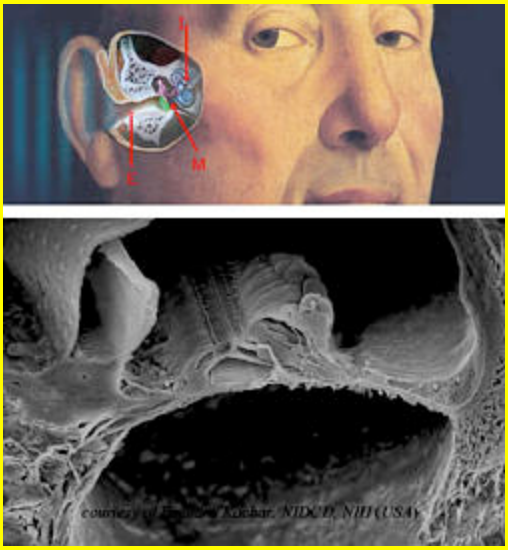
Spring 2005 Colloquium Series
Physics Department
University of Oregon

4:00 Thursdays, 100 Willamette
(Reception at 3:45 in the Atrium)

March 31 **Speaker: Terry Takahashi** University of Oregon	**Title: Stud-ying hooters: how owls locate sounds** **Abstract:** TBA (Host: TBA)
April 7  **Paul Goldbart** Department of Physics University of Illinois at Urbana-Champaign	**Title: The Statistics, the Physics, and the Statistical Physics of Vulcanized Matter** **Abstract:** As Goodyear discovered, when he first vulcanized rubber in 1839, a viscous liquid of macromolecules becomes an unusual, utterly random, solid, provided that enough chemical bonds are introduced between the molecules. Perhaps surprisingly, given the randomness of their architectures, solids formed by the vulcanization process exhibit a number of rather simple and universal features. In this colloquium, I shall give an overview of current

	theoretical and experimental approaches to the physical properties of vulcanized matter and other random-network-forming media, paying special attention to their universal aspects. (Host: John Toner)
April 14  **Speakers: Rhys Thomas, Jugglemania, Portland Oregon; Dr. Stan Micklavzina, Demomania, Dept Of Physics, University of Oregon**	**Improv: The Circus Collider** **Abstract:** The U of O has spawned two "Science Circus" shows. U of O alumnus Rhys Thomas created his "Science Circus" as way to teach Newtonian physics using circus tricks. He has done this for over a decade with highlights like serving as Artist In Residence for The Smithsonian Institution, appearing on a world-wide television broadcast with Nobel Laureate Arno Penzias, and teaching over 26,000 students during 2004 at science museums and schools in the U.S., Canada, and the Caribbean. Local Demo Meister and U of O alumnus Stanley Micklavzina has used entertaining physics demonstrations in public shows to spark interest in science for the past 6 years. Their paths have collided, and this being the World Year of Physics, funds have been procured for the SSC, Superscience Super Circus! The result

	will be a single mutant "Science Circus" that will tour public events across Oregon in celebration of the World Year of Physics 2005. Bring the family and kids as we explore ways to use our crafts to display models of physics for the public and be ready to add your thoughts on how we can map the great ideas of Galileo, Newton, Einstein, etc., with the vaudevillian function. Help find the physics in physical comedy! (Host: Stan Micklavzina)
April 21 **No Colloquium; "Focus on Undergraduate Research" posters in Willamette Atrium instead**	**Title: TBA** **Abstract:** The annual Focus on Undergraduate Research (FOUR) poster session will be held on Thursday, April 21, in the Willamette Hall Atrium. This poster session is open to all undergraduates that have participated in a math or natural sciences related research project. The poster session will provide student researchers with a valuable opportunity to summarize and present their research to faculty and peers. Additionally, it provides us with an opportunity to acknowledge the efforts of our undergraduates, particularly the graduating seniors, and to promote undergraduate research at the U. of O. This will be a judged poster session with awards being presented in

	the categories of Organization and Display, Scientific Merit and Verbal Presentation. (Host: Dean Livelybrooks)
April 28 **Speaker: Dung-hai Lee** University of California at Berkeley	**Title: How to Avoid Classical Order in Exotic Quantum Phases** **Abstract:** TBA (Host: John Toner)
May 5  **Speaker: Ian Shipsey** Purdue University	**Title: Bringing Hearing to the Deaf Cochlear Implants: a Technical and Personal Account** **Abstract:** Cochlear implants are the first device to successfully restore neural function. They have instigated a popular but controversial revolution in the treatment of deafness, and they serve as a model for research in neuroscience and biomedical engineering. In this talk the physiology of natural hearing will be reviewed from the perspective of a physicist, and the function of cochlear implants will be described in the context of historical treatments, electrical engineering, psychophysics,

	clinical evaluation of efficacy and personal experience. The social implications of cochlear implantation and the future outlook for auditory prostheses will also be discussed. About the speaker: Ian Shipsey is a particle physicist. He has been profoundly deaf since 1989. Recently he heard the voice of his 11 year old daughter for the first time, and his wife's voice for the first time in thirteen years thanks to a cochlear implant. The colloquium will be at the level of Scientific American. (Host: Jim Brau)
May 12 **Speaker: TBA**	**Title: TBA** **Abstract:** TBA (Host: TBA)
May 19 **Susan Coppersmith** Department of Physics University of Wisconsin at Madison	**Title: Comparing classical and quantum complex systems** **Abstract:** This talk will present work that attacks the question of whether there are fundamental differences between quantum and

	classical complex systems. Investigating this question is hard for the same reason that qualitatively new phenomena could emerge in quantum systems -- specifying a system of N degrees of freedom classically can be done using a number of variables linear in N, while quantum mechanically the number of variables grows exponentially with N. The talk will discuss different approaches to the problem. The first, long-term, approach is to build a silicon-based quantum dot quantum computer. The shorter term strategy is to do calculations using classical computers, in particular renormalization group calculations for a quantum spin glass in three dimensions with long range interactions, and numerically exact calculations for the dynamics of a quantum spin glass with nearest neighbor interactions in two dimensions. (Host: John Toner)
May 26 **Speaker: TBA** **TBA**	**Title: TBA** **Abstract:** TBA (Host: TBA)
June 2	**Knowledge Networks**

Paul Ginsparg
Department of Physics
Cornell University

Abstract:

I review the background and some recent trends of a particular scholarly information network, arXiv.org, and discuss some of its implications for new scholarly publication models. If we were to start from scratch today to design a quality-controlled archive and distribution system for scientific and technical information, it could take a very different form from what has evolved in the past decade from pre-existing print infrastructure. Near-term advances in automated classification systems, authoring tools, and document formats will facilitate efficient datamining and long-term archival stability, and I discuss how these could provide not only more efficient means of accessing and navigating the information, but also more cost-effective means of authentication and quality control.

(Host: Nöckel)

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