



California State University, Los Angeles

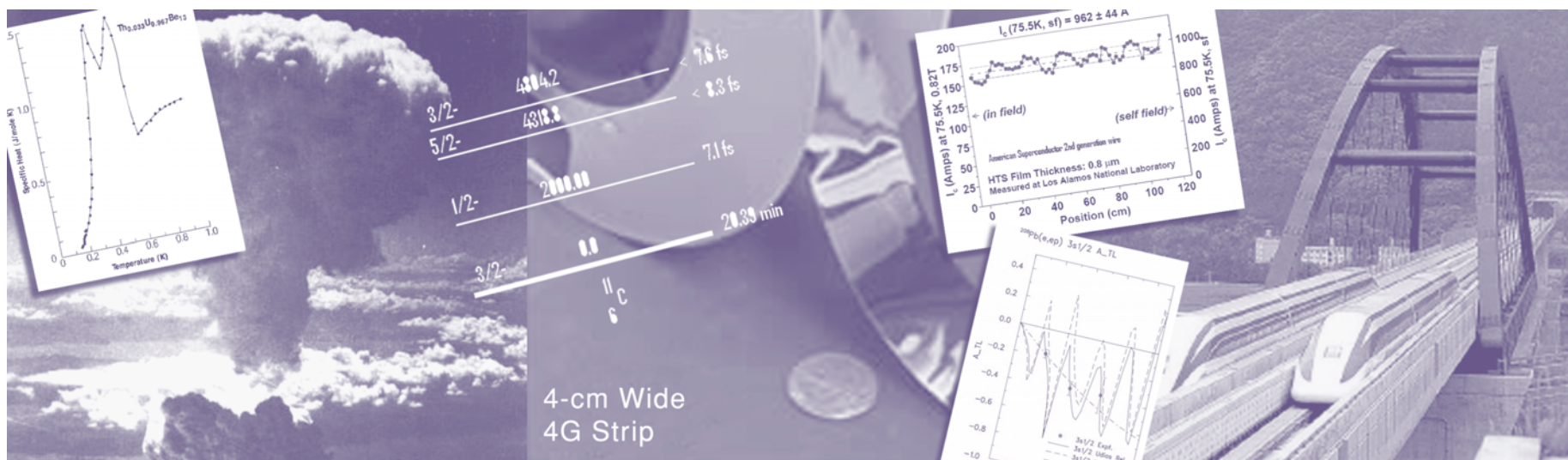
SCIENCE SERIES

THE WORLD YEAR OF PHYSICS

A great surprise in recent years has been the discovery of high temperature superconductors. Newly developed manufacturing processes have brought the practical application of second generation superconductors for large scale transportation and electrical energy transmission tantalizingly close to fruition. Professor Jose Rodriguez will discuss our present understanding of the physics of these fascinating materials and the current status of and anticipated developments in the production of useable wire conductors.

We have frequently seen the famous Einstein relationship derived from his Special Theory of Relativity, $E = Mc^2$. This result helps us to understand the prodigious power output of the stars, the frightfully destructive might of nuclear weapons and the greenhouse gases' friendly power output of nuclear reactors. However, the Special Theory of Relativity is essential for explaining other properties of nuclei as well. Professor Konrad Aniol will discuss recent and proposed experiments to trace the impact of Special Relativity in nuclear physics.

Mankind has been able to further its dominance over all other species due in great part to an ability to manipulate and utilize solid matter in a variety of applications. In particular, the use of metals has revealed the depths of human ingenuity and inspiration since very early in the history of homo sapiens. Yet a consistent understanding of solids from an intellectual point of view started to become a reality only at the beginning of the twentieth century. By that time, a great deal of experimental data had been accumulated, including the discovery of the electron by J.J. Thomson, but the main ideas regarding their interpretation had failed to produce a fundamental picture of the whole. Scientists such as Albert Einstein, Niels Bohr, Felix Bloch, and many others were able to jump-start the development of a modern theory of solids thanks to the introduction of quanta and electron dynamics. Since then, monumental progress in the field has been achieved, spurring among other things the semiconductor industry revolution and the theory of conventional superconductivity. What is a "heavy-fermion" metal? What is a "heavy-fermion" superconductor? Professor Oscar Bernal will explore some of our current understanding regarding the nature of the electronic states in solids.



FALL 2005 - SCIENCE LECTURE SERIES

presented by

The Department of Physics and Astronomy

All lectures will be on Wednesday evenings at 8:00 p.m. in the Physical Sciences Building, room 158. Lectures are free and open to the public. Metered parking is available adjacent to the Physical Sciences Building in Parking Lot B and in the parking structure adjacent to the Luckman Theatre.

SPEAKER	DATE	LECTURE
Jose Rodriguez	Oct. 5, 2005	<i>Physics of Second-Generation Wires Composed of High-Temperature Superconductors</i>
Konrad Aniol	Nov. 2, 2005	<i>The Impact of Special Relativity in Nuclear Physics: It's not just $E = Mc^2$</i>
Oscar Bernal	Nov. 30, 2005	<i>Are Electrons Free in Today's Metals?</i>

Contact the Department of Physics and Astronomy at (323) 343-2100 or physics@calstatela.edu for more information.