

For more information on current physics research at UC San Diego, see:

Astrophysics: <http://cass.ucsd.edu/~ppadoan>

Center for Astrophysics and Space Sciences (CASS): <http://cass.ucsd.edu>

Center for Interface and Materials Science (CIMS): <http://cims.ucsd.edu>

Center for Theoretical Biological Physics (CTBP): <http://ctbp.ucsd.edu>

Cosmology: <http://cosmology.ucsd.edu>

Department of Physics: <http://physics.ucsd.edu>

Institute for Pure and Applied Physical Sciences (IPAPS): <http://ipaps.ucsd.edu>

Nanomovie: <http://www.ucsd.tv/getsmall>

Nanoscience: <http://ischuller.ucsd.edu> and <http://physics.ucsd.edu/~diventra>

Non-Neutral Plasmas: <http://NNP.ucsd.edu>

Physics with low-energy antimatter: <http://positrons.ucsd.edu>

Sensors: <http://nanosensors.ucsd.edu>

Strongly Correlated Electron Physics: <http://mbmlab.ucsd.edu>

Theoretical Biological Physics: <http://ctbp.ucsd.edu/affiliates/showperson.php?id=208>

X-ray nanoscience: <http://oleg.ucsd.edu>

Young Physicists Program (YPP): <http://ypp.ucsd.edu>



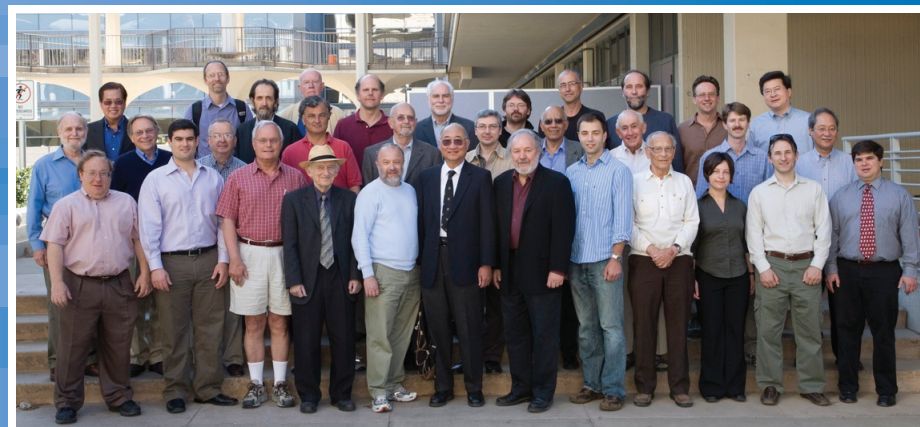
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PHYSICS IS IN EVERYTHING

Physics is all around and it affects everyday life. Many examples of physics discoveries exist which have transformed medicine (X-rays, MRI, ultrasonics), electronics (semiconductors, transistors), computers (giant magnetoresistance, integrated circuits), tagging in supermarkets (lasers), cinematography (color photography), transportation (light emitting diodes, GPS), etc.

The Physics Department at UC San Diego works in many forefront areas in Physics, which have and will surely have a major effect on your life. Areas of research include Nanoscience, Spintronics, Superconductivity, Plasma Physics, Quantum Computing, Biophysics, Particle Physics, Astrophysics, etc.



Physics Faculty

*Mayer Hall, one of
Physics' research buildings*



<http://physics.ucsd.edu>



Prof. Hans Paar inspects the 3.5 m POLARBEAR telescope which will be used for the search for the existence of primordial gravitational waves in the 3 Kelvin Cosmic Microwave Background radiation.

ASTROPHYSICS

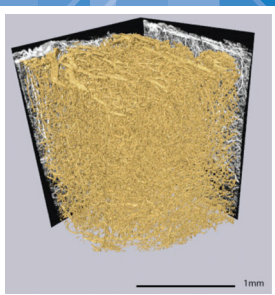
This group seeks to understand the events and processes that shape our universe.



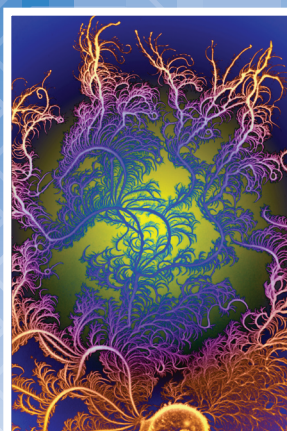
Time history of the universe.

BIOPHYSICS

This group investigates basic issues in molecular through systems level biology. Current research concerns the logic of gene regulation, cooperative interactions among many-protein systems, common motifs of signaling and energy transfer at different levels of biological integration, and the control of sensorimotor tasks.



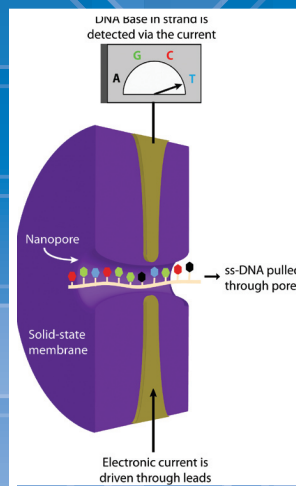
Reconstruction of the mouse vasculature using laser-scanning microscopy and laser-assisted ablation.



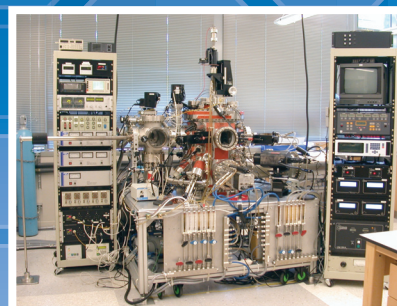
Bacteria colonization defined by limiting their growth conditions, principally nutrition and temperature.

CONDENSED MATTER

This group is dedicated to studies of the properties of materials condensed into the liquid and solid state. These include metals, semiconductors, superconductors, polymers and biological molecules. These are the basis for applications in most modern electronic, storage, medical, sensor and energy related applications.



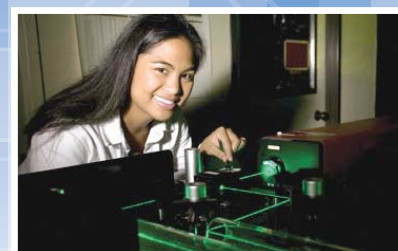
Schematic of the procedure to sequence DNA via transverse electronic transport while it moves through a nanopore.



Organic Molecular Beam Epitaxy apparatus, used for the preparation of novel materials with interesting electrical properties and uses for sensor applications.

PLASMA PHYSICS

This group studies the confinement of charged particles in magnetic fields, using pure electron, pure ion, and pure positron (anti-electron) plasmas. Applications will enable electric power generation by fusion of hot, dense deuterium-tritium plasmas, medical diagnostics and treatment, and space propulsion.

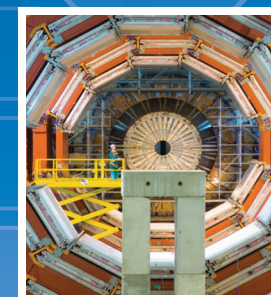


Undergraduate student Allison Bretana helps with laser setup for laser-diagnosed pure ion plasma apparatus.

HIGH ENERGY PHYSICS

This group is active in almost every aspect of the Compact Muon Solenoid (CMS) experiment at the Large Hadron Collider, including detector construction and operation, data acquisition, calibration, reconstruction software, massive computing, and physics analysis.

UCSD graduate students help install the CMS data acquisition system used to analyze and store the most interesting of the almost 1 billion collisions per second.



A technician stands inside CMS surrounded by muon detectors (silver) between layers of iron (red) used for directing the magnetic field.



Graduate student Toby Weber cools the 50,000 Gauss superconducting magnet used to contain positrons (anti-electrons) for atomic and plasma physics research.