

## **Faculty Research Profile, Dept. of Physics & Astronomy The University of Toledo**

JACQUES AMAR (Ph.D., Temple Univ., 1985)

Dynamics of thin-film and epitaxial growth, kinetics of phase separation, scaling and fractal aspects of materials, theory of condensed matter systems far-from-equilibrium, computational physics.

LAWRENCE S. ANDERSON-HUANG (Ph.D., Univ. of Calif. Berkeley, 1977)

Surface mapping of W UMa stars (contact binary stars); theory of stellar atmospheres: spectral line formation, line blanketing, atmospheres with incident radiation.

BRIAN G. BAGLEY (Ph.D., Harvard Univ., 1968)

Phase transformations in condensed systems, glasses, and disordered solids, preparation and properties of thin films, materials science, high temperature superconductivity.

RANDY G. BOHN (Ph.D., Ohio State Univ. , 1969)

Thermal conductivity and specific heat of crystalline and disordered solids from 0.07K to 100K. Heat transport in glasses and glass-ceramics. Electrical transport in thin semiconductor films.

BERNARD W. BOPP (Ph.D., Univ. of Texas at Austin, 1973)

Stellar Chromospheres and surface activity. Variable stars; emission-line stars.

JON BJORKMAN (Ph.D., Univ. of Wisconsin-Madison, 1992)

Theory of rotating stellar winds and the formation of circumstellar disks. Radiation transport and the calculation of observable properties using Monte Carlo Simulation.

KAREN BJORKMAN (Ph.D., Univ. of Colorado-Boulder, 1989)

Observational astronomy, spectroscopy and polarization of massive stars. Circumstellar disks, their structure, physical properties and sizes.

SONG CHENG (Ph.D., Kansas State University, 1991)

Intermediate-energy, atomic and molecular ion collisions.

ALVIN D. COMPAAN (Ph.D., Univ. of Chicago, 1971)

Growth and characterization of semiconductor thin films, laser ablation-deposition, rf sputtering, plasma CVD, ion implantation, laser annealing, solar cell fabrication, II-VI semiconductor light emitters.

LORENZO J. CURTIS (Ph.D., Univ. of Michigan, 1963)

Atomic spectroscopy and atomic structure. Experimental fast ion beam atomic spectroscopy and theoretical and semiempirical systematization of atomic data.

XUNMING DENG (Ph.D., Univ. of Chicago, 1990)

Amorphous silicon solar cell materials and device research, thin film depositions, development of novel electronic and optical materials.

ROBERT T. DECK, *Emeritus* (Ph.D., Univ. of Notre Dame, 1961)

Theoretical problems in nonlinear optics. Of particular current interest is the theory of the surface and waveguide modes of the electromagnetic field. Recent work has produced an improved theory of a "nonlinear directional coupler" which can be envisioned to serve as a switching element in light signal processing devices and an all-optical computer. Other interests include the structure of physical theories and the foundations of quantum mechanics.

DAVID G. ELLIS (Ph.D., Cornell Univ. , 1964)

Theoretical atomic physics, with special interest in spectroscopy of multiply ionized atoms, Rydberg states, relativistic effects in atomic structure, electron-atom collisions, coherent states produced by impulsive excitation.

STEVEN R. FEDERMAN (Ph.D., New York Univ., 1979)

Observational and theoretical investigations into physical processes in interstellar matter.

BO GAO (Ph.D., 1989, Univ. of Nebraska)

Theoretical atomic, molecular, and optical physics. Cold-atom spectra and collisions. Multiphoton processes.

PHILIP B. JAMES (Ph.D., Univ. of Wisconsin, 1966)

Planetary astronomy; atmospheric phenomena on Mars; radiative transfer in dusty atmospheres; climate modeling.

THOMAS J. KVALE (Ph.D., Univ. of Missouri-Rolla, 1984)

Intermediate-energy, experimental atomic physics concentrating on the dynamical interaction of ions and atoms in collisions. Spectroscopy and structure of negative ions and multiply-excited, near-neutral positive ions and atoms.

SCOTT A. LEE (Ph.D., Univ. of Cincinnati, 1983)

Brillouin and Raman light scattering, molecular and solid state physics under ultra-high pressure, DNA/drug and DNA/protein interactions, phase transitions in DNA, and physical properties of hyaluronic acid.

R. ALEJANDRA LUKASZEW

The correlation between structure, surface morphology and physical properties in thin films. The study of magnetic thin films and patterned nano-structures (nano-magnets). The application of magnetic thin films to devices (e.g. spin-dependent tunneling applications) The study of the growth mode of thin films.

NANCY D. MORRISON (Ph.D., Univ. of Hawaii, 1975)

Determination of orbital elements and study of brightness variations in spectroscopic binary stars. Spectroscopic study of atmospheres and winds of supergiant stars.

RICHARD M. SCHECTMAN, *Emeritus* (Ph.D., Cornell Univ., 1962)

Alignment and orientation in fast ion beam collision processes, beam foil spectroscopy, and Monte Carlo calculations of atomic scattering processes. (*Emeritus-superannuate*)

CONSTANTINE E. THEODOSIOU (Ph.D., Univ. of Chicago, 1977)

Atomic structure and atomic collision processes; photoionization and multiphoton processes.

ADOLF N. WITT (Ph.D., Univ. of Chicago, 1967)

The nature of interstellar dust grains. Scattering and absorption properties of grains in the UV and visible. Near-IR luminescence by hydrogenated amorphous solids. Radiative transfer in reflection nebulae and globules. Depletion of heavy elements in space. Structure of interstellar clouds.