

Centers and Institutes

Alliance for Catholic Education

Academic Director:

Thomas Doyle, Ph.D., *Professional Specialist*

Telephone: (574) 631-7052
 Fax: (574) 631-7939
 Location: 112 Badin Hall
 E-mail: ace.1@nd.edu
 Web: <http://www.nd.edu/~ace>

The Alliance for Catholic Education (ACE) seeks to develop a corps of highly motivated and committed young educators to meet the needs of our country's most underserved elementary and secondary schools.

To carry out its core teaching mission, ACE recruits talented graduates from a broad variety of undergraduate disciplines, representing a diverse set of backgrounds and experiences, and provides an intensive two-year service experience encompassing professional development, community life, and spiritual growth. These three components are at the heart of the ACE initiative. They aim to provide excellence in education and to maximize opportunities for personal and professional growth for program participants.

ACE teachers undergo an intensive teacher education in Notre Dame's master of education program under the direction of Thomas Doyle. The ACE professional training spans two years and integrates graduate-level course work with an immersion experience in teaching. During the two summers after admission to the program, ACE teachers live and study together at the University of Notre Dame. The summer sessions combine an innovative teaching curriculum taught by seasoned practitioners and select faculty from the University of Notre Dame as well as from other major universities with supervised field experience in both the public and Catholic elementary schools of South Bend, Indiana, and in the Upward Bound Program at Notre Dame.

At the completion of the summer training component, ACE teachers travel to underresourced parochial schools of the Southeast and Southwest to serve as full-time teachers during the regular school year. In addition to the support of mentor-teachers in the parochial schools where they teach, all ACE teachers are brought together once during the school

year in a retreat setting to deepen and enhance their commitment to becoming professional educators. Upon completion of two years in the ACE program, participants will have fulfilled the requirements for a master of education degree and will have provided an urgently needed presence in the lives of our nation's school children.

In addition to a fully funded graduate program, ACE participants receive a modest monthly stipend, medical insurance, travel reimbursement, and an educational award of \$4,725 from the Corporation for National Service.

Begun in 1994, ACE currently has over 150 recent graduates from the University of Notre Dame and Saint Mary's College, as well as a number of other select colleges and universities. These graduates teach in over 100 parochial schools throughout the urban and rural Southern United States.

Center for Applied Mathematics

Director:

Panos Antsaklis, *the H. C. and E. A. Brosey Professor of Electrical Engineering*

Telephone: (574) 631-7245
 Fax: (574) 631-6579
 Location: 262 Hurley Hall
 E-mail: cam@nd.edu
 Web: <http://www.nd.edu/~cam>

The Center for Applied Mathematics was established to enhance interdisciplinary use of applied mathematics and to provide support for faculty and student research. The center promotes interaction and cooperation among the Notre Dame researchers using mathematics in a variety of disciplines spanning engineering and science and including business and social sciences. It also helps in faculty development by acting as a University source of information on new mathematical concepts and methods essential for developing and carrying out innovative and timely interdisciplinary research at Notre Dame. The center works closely with the interested departments to formulate, establish, and help coordinate the applied mathematics courses at the University.

The primary activities of the center are as follows:

1. Sponsor lecture series and seminars for faculty and graduate students.
2. Sponsor short and long term faculty visitors working in interdisciplinary research projects in applied mathematics.
3. Support student research by providing fellowships to a limited number of graduate students designated as center fellows; also by providing summer fellowships to a limited number of graduate and undergraduate students.
4. Sponsor an annual research workshop for graduate students.
5. Promote interdisciplinary research groups and help secure funding for research.
6. Give institutional recognition to members of the Notre Dame faculty doing research in applied mathematics.

Center for Astrophysics

Director:

Grant J. Mathews, *Professor of Physics*

Telephone: (574) 631-6919
 Fax: (574) 631-5952
 Location: 225 Nieuwland
 E-mail: astro@nd.edu
 Web: <http://www.nd.edu/~astro>

The Center for Astrophysics at Notre Dame University (CANDU) provides a synergistic focal point for various faculty research interests under the common theme of "astrophysical and cosmological origins" and encourages collaborations both within and beyond the University community.

The national and international visibility of Notre Dame within the astrophysics community has steadily increased in recent years, with world-renowned programs in theoretical/observational cosmology, nuclear astrophysics, cosmic-ray physics, dark matter searches, solar system formation, and extra-solar planet searches. In addition, Notre Dame has made a commitment to the Large Binocular Telescope (LBT) international collaboration. When completed, the LBT will be the largest telescope in the world on a single mount. It will provide image resolution as much as 10 times better than the Hubble Space Telescope.

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Research activities of the center focus on cross-disciplinary efforts to explore outstanding scientific questions concerning the origin and evolution of astrophysical phenomena. In addition to the specific scientific missions outlined below, CANDU acts as a cross-disciplinary focal point for interactions among scholars with related interests in other departments such as mathematics, history, philosophy, and the Program of Liberal Studies. Two specific areas of research/collaboration targeted by CANDU fall under the headings of astrophysical and cosmological origins.

Cosmological origins includes topics such as the origin and structure of the universe, the big bang, primordial nucleosynthesis, cosmic background radiation studies, measurements of cosmological expansion rate, age, and matter content, the origin and evolution of galaxies, space-time geometry, and historical, philosophical, and theological foundations.

Astrophysical origins is concerned with the origin of stars and the formation of extra-solar planetary systems, origin and evolution of the elements in stars and supernovae, origin of cosmic rays, gamma-ray bursts, astrophysical neutrinos, and gravity waves.

The center encompasses a broad range of academic interests and is a focal point for undergraduate and graduate research projects. It provides fellowship support for both undergraduate and graduate students, and it also acts as a forum for public outreach and invited lecture series, providing a unique academic environment for intellectual progress.

Another activity of the center is to provide and develop space-based missions. The center is currently developing a NASA mission to detect Earth-mass planets orbiting other stars through an innovative gravitational lensing technique. This will also detect supernovae at large distances, providing a means to measure the age and acceleration of the universe.

Other significant facilities of CANDU include access to the Vatican Telescope; telescope facilities at Mt. Stromlo, Australia, and in South Africa; the Notre Dame nuclear accelerator laboratory; and the Notre Dame Project GRAND cosmic air shower array.

Center for Environmental Science and Technology

Director:

Patricia A. Maurice, *Associate Professor of Civil Engineering and Geological Sciences*

Telephone: (574) 631-8376

Fax: (574) 631-6940

Location: 152A Fitzpatrick Hall

E-mail: cest.1@nd.edu

Web: <http://www.nd.edu/~cest>

The Center for Environmental Science and Technology, established in 1987, conducts basic scientific and engineering research that involves faculty from all divisions of the Graduate School. The center serves as a focal point for the promotion and encouragement of the following activities:

1. Conduct basic research in pollution control that combines microbiology, biochemistry, physical chemistry, geochemistry, mathematics, and physics with engineering.
2. Educate undergraduate and graduate science and engineering students to the need for and methods of science-based environmental research.
3. Develop innovative technologies grounded in sound scientific principles for application to environmental problems.
4. Develop interdisciplinary teams to apply cutting-edge technologies to real world problems in many areas of national and international concern.

As a cooperative effort between the Colleges of Engineering and Science, the center fosters interdisciplinary environmental research and education by providing cutting-edge analytical technologies needed to address environmental problems. The goals of the center are to develop a truly comprehensive research and educational program, and to ensure that students obtain basic scientific knowledge needed to address current and future pollution control problems.

Students connected with the center are either enrolled in a degree program in one of the participating departments (e.g., biological sciences, chemical engineering, chemistry and biochemistry, civil engineering and geological sciences, mathematics, physics, or anthropology) or visiting from another institution. The center supports students through the Bayer endowment for predoctoral and postdoctoral fellowships, in addition to various internship opportunities.

Center for Flow Physics and Control

Director:

Thomas C. Corke, *the Clark Professor of Aerospace and Mechanical Engineering*

Telephone: (574) 631-7007

E-mail: flowpac@nd.edu

Web: <http://www.nd.edu/~flowpac>

The University of Notre Dame has a long tradition of achievement in experimental fluid dynamics and aerodynamics that dates back to 1882, with the development of one of the earliest wind tunnels in the United States. Since 1943, contributions to aircraft technology from Notre Dame's Aerospace Engineering Laboratory have been recognized world wide through its development of low-turbulence, subsonic, transonic, and supersonic, smoke-visualization wind tunnels. These unique wind tunnels continue to support new research, and form the nucleus of the other new facilities.

As an outgrowth of this long tradition, the Center for Flow Physics and Control was formed in 2001. Research funding comes from a broad number of government agencies, including all branches of the Department of Defense (Army, Air Force and Navy); DARPA; and NASA Langley, Ames, Glenn, and Dryden Research Centers. A general theme of research that bridges this group involves flow diagnostics, prediction, and control. A combination of basic research is aimed at verifying or developing theories for fluid dynamic behavior, and the application of theory towards controlling flows. The work has involved a multitude of flow fields including laminar and turbulent boundary layers, jets, shear layers, and wakes at incompressible and compressible Mach numbers. The applications have included transition control, drag reduction, mixing, flow-induced vibration, and acoustics.

In addition to experiments, the center continues a long tradition of theoretical and computational fluid dynamics (CFD) and modeling of complex flows. The combination of these elements in a single site is a particular strength of the group.

The facilities in the center are primarily located in the Hessert Laboratory for Aerospace Research. This is a modern 40,000-square-foot building that includes laboratories, computer facilities, fully staffed machine and electronics shops, faculty and student offices, and conference and meeting rooms.

The research facilities include numerous high-quality subsonic, transonic, and supersonic wind tunnels, as well as specialty facilities such as a high-speed heated anechoic jet facility, an anechoic open-jet wind tunnel, and an atmospheric boundary layer wind tunnel. Specialized laboratories focus on particle dynamics, optical measurements, digital time-series acquisition and image processing, and computational fluid dynamics.

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Research in the center is broken into five areas—aero-optics, aero-acoustics, fluid-structure interactions, multiphase flows, and intelligent flow control—and involves faculty in the departments of aerospace and mechanical engineering, electrical engineering, civil engineering and geological sciences, computer science and engineering, and mathematics.

Advisers from industry provide intellectual feedback and industrial teaming.

Center for Molecularly Engineered Materials

Director:

Paul J. McGinn, *Professor, Department of Chemical & Biomolecular Engineering*

Telephone: (574) 631-6151

Fax: (574) 631-8366

Location: 178 Fitzpatrick Hall

E-mail: cmem@nd.edu

Web: <http://www.nd.edu/~cmem>

Materials engineered at the molecular level offer tremendous potential for new technological applications, especially in key industries such as aerospace, automotive, biomaterials, chemicals, defense, electronics, energy, metals, and telecommunications.

The Center for Molecularly Engineered Materials actively explores multidisciplinary fundamental concepts in materials science and engineering, with emphasis on the study of materials at the molecular level. At Notre Dame, it is the primary interdisciplinary unit dedicated to the molecular-level design, synthesis, characterization, and development of advanced materials.

The center's objective is to utilize molecular-level engineering of materials to explore promising technological applications in a variety of fields ranging from catalysts, adsorbents, and sensors to fuel cells, biomaterials, and nanomagnetism. An important focus of the center is integrating materials engineering over length scales from the molecular up to macroscopic dimensions so as to have maximum utility. A key goal is to serve as a national resource for exploring long-range molecular-level materials engineering concepts for applications that would otherwise not be possible due to the near-term focus of the commercial sector.

The aim is to develop materials and systems whose structure and components exhibit novel and significantly improved physical, chemical, and biological properties, phenomena, and processes, due to their molecular-scale design and engineering. Included among the areas of emphasis are the synthesis and characterization of new materials with features on the molecular scale, experimental studies and mathematical modeling, and advanced processing techniques. For example, molecular-level synthesis and assembly methods will result in chemical/biological

sensors with improved accuracy and sensitivity that can rapidly test large quantities of food for bacterial contaminants or airborne toxins; novel catalyst structures that provide both an ideal chemical environment on the molecular scale and the optimal macrostructure for efficient high-volume chemical, petroleum, and pharmaceutical processing; significant improvements in semiconductor interfaces for solar energy conversion; environmentally benign corrosion inhibitors; and better sensors and controls to increase efficiency in manufacturing.

The center integrates interdisciplinary research groups in catalysis and reaction processes, electrochemical interfaces and processes, nanostructured materials, advanced processing techniques, and biology inspired materials. It includes researchers from several departments in the Colleges of Engineering and Science and the Radiation Laboratory. The thrust activities are synergistically planned, coordinated, and executed so as to provide a coherent approach to targeted and evolving concepts.

Center for Nano Science and Technology

Director:

Wolfgang Porod, *the Frank M. Freimann Professor of Electrical Engineering*

Telephone: (574) 631-6376

Fax: (574) 631-4773

Location: 203 Cushing Hall

E-mail: ndnano@nd.edu

Web: <http://www.nd.edu/~ndnano>

Research conducted in the Center for Nano Science and Technology entails the study of small device structures and device-related phenomena on a spatial scale of less than one-tenth of a micron—that is, one thousandth the diameter of a human hair. The center integrates research programs in molecular- and semiconductor-based nanostructures, device concepts and modeling, nanofabrication, electrical and optical characterization, and integrated systems-level design to address common application goals.

The center comprises a multidisciplinary collaboration of faculty from the departments of electrical engineering, computer science and engineering, chemistry and biochemistry, and physics who are exploring fundamental concepts and issues in nano science and developing unique engineering applications using principles of nano science. The center was established on a base of 15 years of faculty research and educational development at Notre Dame in nano science and technology.

At present, center faculty are engaged in such initiatives as quantum-based devices and architectures; high-speed resonant-tunneling devices and circuits; photonic integrated circuits; the interaction of biological systems with nanostructures; and the design and fabrication of microelectromechanical systems.

In addition to training students for immediate participation in nano science and technology and preparing them to be productive and extremely competitive in the future marketplace, the center also allows faculty to conduct avant-garde research and provides industry leaders with a forum, a "think tank," to explore long-range ideas. Involvement with industrial technologists also benefits students by providing experience in working with the commercial sector.

Keck Foundation Initiative

The W.M. Keck Foundation Initiative on "Integrated Nanoelectronics: Information Processing at the Molecular Level" is a major research program within the Center for Nano Science and Technology.

This initiative explores the use of nanoelectronics in developing radically different approaches to information processing. The research aims to combine novel device concepts with both fundamental fabrication issues in physics and chemistry and higher-level integration issues of systems, architectures, and algorithms. This initiative builds on the notion of Quantum-Dot Cellular Automata (QCA), a concept developed at Notre Dame, which is based on encoding binary information through the charge configuration of quantum-dot cells.

Facilities

(<http://www.nd.edu/~ndnano/research.htm>)

The center has excellent on-site research facilities and capabilities. These include nano-lithography and scanning tunneling microscopy; nanodevice and circuit fabrication; nano-optical characterization including femtosecond optics and near-field scanning optical microscopy; electrical characterization at helium temperatures and in 10 T magnetic fields; 50 GHz high-speed circuit analysis; and device and circuit simulation and modeling. In recent years, federal grants received to support research in nano science and technology total approximately \$10 million.

Center for Philosophy of Religion

Director:

Thomas P. Flint, *Professor of Philosophy*

Telephone: (574) 631-7339

Location: 418 Malloy Hall

E-mail: cpreglig.1@nd.edu

Web: <http://www.nd.edu/~cpreglig>

The Center for Philosophy of Religion was established at Notre Dame in 1976. Although operating in close association with the Department of Philosophy, it is not a degree-granting institution. Its aim is to advance the understanding of religion and religious belief and to promote and advance a specifically Christian and theistic approach to some of the main topics and problems of philosophy.

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In pursuit of these goals, the center sponsors several different sorts of activities. First, it offers stipendiary fellowships on a competitive basis to scholars who then come to Notre Dame to work on projects in philosophy of religion and Christian philosophy. It also extends nonstipendiary resident fellowships to scholars who are on sabbatical leave and would like to come to Notre Dame to work on a topic in Christian philosophy or philosophy of religion; such fellows receive guest faculty status and secretarial services.

The center periodically sponsors conferences and lectureships on selected issues.

The center also publishes a series of volumes that includes conference proceedings and monographs. The center will address its subject from within a posture that is committed and Christian; its perspective (though not necessarily that of its fellows and lecturers) is that of the committed believer, rather than one of artificial neutrality.

Center for Tropical Disease Research and Training

Director:

Frank H. Collins, *the George and Winifred Clark Professor of Biological Sciences*

Telephone: (574) 631-8045
 Fax: (574) 631-3996
 Location: 315 Galvin Life Sciences
 E-mail: CTDRT.1@nd.edu
 Web: <http://ctdrt.bio.nd.edu>

The Center for Tropical Disease Research and Training (CTDRT) is an administrative structure at the University of Notre Dame that brings together a diverse group of faculty, staff and students from several different colleges and departments in the University whose research and teaching is focused on human pathogens and their invertebrate and vertebrate vectors, the diseases caused by these organisms, and the impact of these diseases on human society. Members of CTDRT are concerned in particular with the impact of infectious diseases in less developed parts of the world, and research interests of center members range from biomedical science to issues of human rights. Center members also work on new and emerging infectious diseases of importance in the United States, especially those like West Nile encephalitis and Lyme disease whose public health impact is significantly influenced by human impacts on the environment. Among the diseases studied at CTDRT are malaria, toxoplasmosis, tuberculosis, lymphatic filariasis, leishmaniasis, dengue, and West Nile encephalitis. Many faculty work specifically on arthropod vectors, particularly mosquito vectors of arboviruses, filarial worms, and malaria parasites, tick vectors of the Lyme disease spirochete, and sand fly vectors of *Leishmania* parasites. Examples of some of the areas of research interest among center faculty include:

- Biology of Intracellular Pathogens
- Genomics and Integrative Research
- Tools for Genetic Engineering of Vectors and Pathogens
- Population and Evolutionary Genetics
- Rational Drug Design
- Interdisciplinary Approaches to Global Health

Faculty in CTDRT receive support from major federal funding agencies such as the NIH, NSF, DOD, and USDA, from private foundations like John D. and Catherine T. MacArthur Foundation, Ellison Medical Foundation, Burroughs Wellcome Fund, and the Bill and Melinda Gates Foundation, from international funding bodies like the World Health Organization, from pharmaceutical industries, from the state of Indiana, from the University of Notre Dame, and from private benefactors. The center has sponsored a number of program grants, including the a Gates Foundation lymphatic filariasis elimination program in Haiti, a NIAID Tropical Disease Research Unit grant, and an NIH Training Grant in Experimental Parasitology and Vector Biology that has trained graduate students and postdoctoral fellows for more than three decades.

Charles and Margaret Hall Cushwa Center for the Study of American Catholicism

Director:

Timothy Matovina, *Associate Professor of Theology*

Telephone: (574) 631-5441
 Fax: (574) 631-8471
 Location: 1135 Flanner Hall
 E-mail: cushwa.1@nd.edu
 Web: <http://www.nd.edu/~cushwa>

The Cushwa Center for the Study of American Catholicism is widely recognized as the leading center for the historical study of Roman Catholicism in the United States.

Cushwa Center seminars, conferences, and research projects, many of which produce scholarly volumes or popular educational publications, engage a national body of historians and colleagues from theology, women's studies, sociology, ethnic studies, religious studies, American studies, and English. The center also provides resources and critical commentary for media coverage of U.S. Catholicism and collaborates with church leaders and pastoral workers to enhance the vitality of Catholic life in the United States. In all aspects of its mission—research, teaching and faculty development, and public service—the Cushwa Center seeks interdisciplinary and ecumenical cooperation.

Events

The Cushwa Center sponsors a number of programs that promote the study of American Catholicism:

Twice a year, the American Catholic Studies Seminar brings scholars from across the country to present papers at Notre Dame. Published in a working paper format, these essays are made available to the public for the cost of duplication.

Once a year a prominent scholar in the field of American Catholic studies delivers a Cushwa Center Lecture.

The Notre Dame Seminar in American Religion is a semiannual gathering of historians of American religion and other scholars who meet to discuss a recent book published in the field. The author of the book is present for the seminar.

The Cushwa Center sponsors a conference each spring, covering topics such as: Catholicism in Twentieth Century America, U.S. Hispanic Catholicism, African American Catholicism, and Catholicism in International and Comparative Contexts.

Publications and Research

The Cushwa Center's American Catholic Studies Newsletter, published twice a year, reviews the latest scholarship in the field. It also features personal news items and provides information on archival holdings pertinent to the study of U.S. Catholicism.

In conjunction with the university of Notre Dame Press, the Cushwa Center publishes two book series: *Notre Dame Studies in American Catholicism* and *The Irish in America*. The fourteen books published to date in these series, as well as the center's specialized studies of the growth of Hispanic Catholicism in the United States and the history of Catholic parish life, have helped to build the Cushwa Center's reputation. Increasingly, the center is also earning recognition for important interdisciplinary research in American religion and culture, the experiences of women in religious history, the impact of the Second Vatican Council on the American Catholic community, and the Catholic presences and diverse religious practices of U.S. Catholic men and women in the twentieth century.

Research travel grants, offered annually, assist scholars who wish to use Notre Dame's library and archival collection in Catholic Americana.

The center also administers a Hibernian Research Award and a program of lectures, publications, and conferences related to the Irish American experience. These activities are funded by an endowment from the Ancient Order of Hibernians.

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Twentieth Century Project

Initiated in 1997, "Catholicism in Twentieth Century America" seeks to integrate the experiences and contributions of Catholics more fully into the narratives of American history. Faculty and dissertation fellows participated in one of three working groups: Public Presences, Catholic Women, and Catholic Practices and Identity. Several completed manuscripts from the project have been published in a new publication series, *Catholicism in Twentieth Century America*, which is under the general editorship of Scott Appleby and sponsored by the Cushwa Center and Cornell University Press.

Devers Program in Dante Studies

The Albert J. Ravarino Director:

Theodore J. Cachey Jr., *Professor of Italian Language and Literature*

Telephone: (574) 631-5610

Fax: (574) 631-6308

Location: 102 Hesburgh Library

E-mail: devers@nd.edu

Web: <http://www.dante.nd.edu>

The William and Katherine Devers Program in Dante Studies supports rare book acquisitions in the John A. Zahm, C.S.C., Dante Collection, as well as teaching and research about Dante across the humanities curriculum, in particular in the medieval and Italian studies areas, through the sponsorship of conferences, fellowships, lecture series, seminars, and visiting professorships. It also sponsors print and electronic publications of scholarly research through the Devers Series in Dante Studies, published by the University of Notre Dame Press, and as a founding member of the ItalNet Consortium for the creation of scholarly internet resources in the Italian studies area. The Devers Program also funds an annual program of research and travel grants for faculty and students.

Erasmus Institute

Director:

Rev. Robert E. Sullivan, *Associate Professor of History*

Telephone: (574) 631-9346

Fax: (574) 631-3585

Location: 1124 Flanner Hall

E-mail: erasmus@nd.edu

Web: <http://www.nd.edu/~erasmus>

The Erasmus Institute, an international Catholic center for advanced studies at the University of Notre Dame, fosters mainstream academic research drawing on the intellectual traditions of the Abrahamic faiths. Founded in 1997, the institute serves scholars who are applying the resources of Christian, Jewish, and Muslim thought

to currently important topics in the humanities, social sciences, law, and arts. That rich cultural legacy clearly bears on much present-day scholarly inquiry apart from the disciplines of theology and religious studies. In political science, for example, the just war theory, which draws heavily on Catholic thinkers beginning with Augustine, is as important to many secular theorists and strategists as to their Christian colleagues. Among the projects that the Erasmus Institute has supported are a study of the role of Catholicism in shaping indigenous historical memory in early colonial Peru (Sabine MacCormack, University of Michigan), a project on the appropriation and adaptation of Pauline representations of Jews and women in the construction of Christian identity in early English literature (Lisa Lampert, University of California, San Diego), and a study of Emerson between the idealism of Jonathan Edwards and the pragmatism of William James (Roger Lundin, Wheaton College). Though concerned primarily with the Catholic intellectual heritage, the institute supports complementary research deriving from other Christian intellectual traditions as well as from Jewish and Islamic ones. It invites the participation of scholars without regard to religious belief.

By encouraging work of this sort, the institute hopes, on the one hand, to enrich our common academic efforts with neglected assets and, on the other, to strengthen ties between the church's intellectual life and that of the academy. In so doing, the institute seeks to promote scholarship of high quality, reflecting a broad array of interests, without aligning itself with any ideological perspective.

International in the scope of its mission, the Erasmus Institute offers residential fellowships at its center on the campus of the University of Notre Dame for scholars at the faculty, postdoctoral, and dissertation stages. It also arranges summer seminars for graduate students and faculty.

Hessert Laboratory for Aerospace Research

Director:

Thomas C. Corke, *Clark Professor of Aerospace and Mechanical Engineering*

Telephone: (574) 631-7007

Fax: (574) 631-8355

Location: 104 Hessert Laboratory

E-mail: amedept@nd.edu

Web: <http://www.nd.edu/~ame/facilities/Hessert.html>

The Hessert Laboratory for Aerospace Research is a building dedicated in 1991, which houses a variety of specialized experimental research facilities, graduate students, and faculty. The laboratory is primarily used by faculty and students in the Department of Aerospace and Mechanical Engineering, and is the home for the Center for Flow Physics and Control.

The Main Laboratory contains a wide variety of research wind tunnels. These include indraft subsonic tunnels, indraft and blowdown transonic and supersonic tunnels, an anechoic wind tunnel, an atmospheric wind tunnel, and a closed circuit water tunnel. These wind tunnel facilities are supported by data acquisition and instrumentation including laser doppler anemometry, particle image velocimetry, hot-wire anemometry, and force balance capabilities for both subsonic and supersonic flows. These facilities are currently being used to perform research in areas of flow stability, and turbulence transition, high angle of attack and high lift aerodynamics, bluff body flows, aero-acoustics, fluid-structure interactions, and aero-optics.

The laboratory also contains a number of specialized facilities including those for the study of the dynamics of solid and liquid particles, the development of aero-optic measurement techniques, and the control of fluid instabilities. The Hessert Laboratory is used for a variety of graduate and undergraduate educational programs including experimental measurements. All of the research and educational activities are supported by fully staffed electronics and machine shops.

Institute for Church Life

Executive Director:

John Cavadini, Ph.D., *Chair and Associate Professor of Theology*

Telephone: (574) 631-5510

Fax: (574) 631-6968

Location: 1201 Hesburgh Library

E-mail: icl@nd.edu

Web: <http://www.nd.edu/~icl>

The Institute for Church Life (ICL) exists as an integral component of the University's larger mission of teaching, research, and service to society and to the Church. Through its resources, projects, and affiliate centers the institute reaches out to the whole spectrum of Church leaders—its bishops, clergy, religious, and laity—to provide training and service as well as opportunities for spiritual rejuvenation and personal growth.

In this work, the institute seeks to embody the spirit and mandate of the Second Vatican Council, to implement a mission of transforming the Church and society in light of the Gospel, and to renew the theological, ministerial, pastoral, catechetical, and liturgical traditions of the Church. In part, the institute's efforts are realized through its ongoing collaboration with the Center for Pastoral Liturgy, the Center for Social Concerns, NDVI (the Notre Dame Vocation Initiative), STEP (Satellite Theological Education Program), and the academic departments and schools of Notre Dame, especially the Department of Theology.

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For more than 25 years, ICL has provided distinguished leadership through its publications, training sessions, service to episcopal and national organizations, involvement in social concerns, research, and educational programs. Guided by its executive committee, ICL is expanding its programs and initiatives for the special needs of a Church at the beginning of the new millennium.

As a bridge between the University and the Church, ICL links programs and personnel on campus with Church leaders, University graduates, and others who are concerned with the development of vital communities of faith. Further, ICL hopes to serve as a catalyst for cooperation among a variety of entities and agencies within the University and within the Church.

Components of the Institute for Church Life

The Center for Pastoral Liturgy is concerned primarily with the pastoral dimensions of the reform of liturgy that express and shape the religious experience of people. Bringing together a variety of resources, the center's staff provides educational programs on the liturgy and pastoral life to assist parishes and dioceses with renewal of worship. The center also sponsors an annual conference at Notre Dame as well as regional conferences, and publishes a newsletter, Assembly, and books on various aspects of worship. Established in 1971, the Notre Dame Center for Pastoral Liturgy was designated by the bishops in the United States as an official liturgical center.

The Center for Social Concerns offers programs aimed at raising the consciousness of students, faculty, staff, and alumni/ae to social, cultural, and justice issues in our society. Experiences in the South Bend area, throughout the United States, and internationally are developed for participating students and enhanced with course work, readings, and discussion. The staff also works with faculty to assist them in incorporating into their courses information about justice issues, as well as experiential and community-based service learning models appropriate to their courses. The center staff invites the discussion of self-initiated social justice, service, and leadership opportunities with interested graduate students.

Retreats International (RI), a professional organization serving the larger retreat movement, provides the structure and format for networking and collaboration among its some 360 member retreat centers and houses of prayer. RI also gathers and publishes significant data pertinent to retreat/renewal ministry, and publishes various monographs on topics of interest to those involved. Retreats International conducts the Institute for Adult Spiritual Renewal on the Notre Dame campus that attracts more than 500 persons involved in many church ministries.

The Satellite Theological Education Program (STEP) provides quality theological education to pastoral ministers and other adult Catholics from di-

oceses across the country. The primary services STEP provides are designed to assist dioceses enhance catechetical, ministry formation, and adult education programs through online courses ("eCourses"). STEP eCourses are conducted entirely online via the Internet with the adult learner in mind, taking advantage of the flexibility this medium allows to bring the resources of Notre Dame to dioceses and parishioners from across the country. Beginning with the fall 2004 semester, STEP will assist the Theology Department with the development and delivery of online courses for credit as part of the department's M.A. program.

Vocare, the Notre Dame Vocation Initiative, was established to help students "understand their future work in light of their faith commitments and provide talented young people with opportunities to explore ministry, either lay or ordained, as their life's work." Vocare intends to foster a sense of vocation in a broad range of youth, from high-school students to young adults who have graduated from college. It has three component programs, one directed to Notre Dame students and faculty, another to high-school youth, and the third to Notre Dame graduates as they make the transitions into careers.

Institute for Educational Initiatives

Director:

Rev. Timothy R. Scully, C.S.C., *Professor of Political Science*

Telephone: (574) 631-0464

E-mail: pauley.1@nd.edu

Web: <http://www.nd.edu/~iei>

In its mission to improve the education of all youth, particularly the disadvantaged, the Institute for Educational Initiatives conducts four programs designed to address specific educational goals. These are the Program on the Social Organization of Schools, the Alliance for Catholic Education (ACE), the Mendelson Center for Sports, Character, and Community. Through the research and teaching of these programs, the institute seeks to contribute to the revitalization of American education and, consistent with Notre Dame's mission as a Catholic university, to benefit parochial education in a special way.

The Program on the Social Organization of Schools conducts basic and applied research on school and the learning process. Researchers study the formal and informal organization of schools, the curriculum, teacher practices, and student social relationships in an effort to determine how these factors interact with student background and ability to affect student learning. Special attention is given to the study of Catholic schools, particularly in reference to the education of at-risk students.

The Alliance for Catholic Education seeks to develop a corps of highly motivated and committed young educators to meet the needs of our country's most underserved elementary and secondary schools. ACE teachers undergo an intensive teacher education program that spans two years and integrates graduate-level course work with an immersion experience in teaching. The ACE program also seeks to influence and support Catholic education through educational outreach. Outreach activities include support for mentoring and tutoring in the South Bend area schools, summer institutes for Catholic school superintendents, assistance for foundations interested in educational issues, and partnerships with teacher-service programs at other colleges and universities.

The Mendelson Center for Sports, Character and Community encourages sport participants, sport organizations, sports leaders, and educational institutions that sponsor sport programs to embody values and behaviors that promote holistic human development and social justice. In recognition of the importance of sport in contemporary society and culture, the center conducts research on the relationship between sport and broader culture, exploring both the possibilities and the limitations of sport's contributions to a more just and compassionate world. It also develops and offers educational opportunities for those involved in sport and holds a biennial conference. The center also houses the Institute for Coaching and Education.

Institute for Latino Studies

Director:

Gilberto Cárdenas, *Assistant Provost and the Julián Samora Professor of Latino Studies*

Telephone: (574) 631-4440

Location: 230 McKenna Hall

E-mail: latino@nd.edu

Web: <http://www.nd.edu/~latino>

The Institute for Latino Studies was founded in 1999 to advance knowledge and understanding of the Latino experience in the United States. Building upon the outstanding intellectual tradition of Julián Samora (professor in the Department of Sociology, 1959–1985), the institute fosters interdisciplinary study, research and outreach in Latino studies as a vital component of the University's mission. The institute promotes and develops Latino-focused scholarship by working with students, faculty, and fellows to create a University-wide academic program, including an undergraduate minor in Latino studies. Its Galería América offers exhibitions and special programs on Latino art, and the Julián Samora Library and Archives provide resources for study and reflection.

The institute conducts research in areas central to our nation's future through five programs:

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The Inter-University Program for Latino Research (IUPLR) is a nationwide consortium of 16 Latino centers for which the institute serves as headquarters. IUPLR is also an official Census Information Center and disseminates census information and analysis to its consortium members and the public.

Latino Ecclesial and Pastoral Concerns addresses pastoral issues and theological questions in the Catholic context and works closely with the Department of Theology.

Border and Inter-American Affairs explores points of intersection between the interests of U.S. Latinos and the populations of their countries of origin.

The Center for the Study of Latino Religion conducts ecumenically focused research on the impact of religion on the political, social, cultural, and educational life of U.S. Latinos.

The Metropolitan Chicago Initiative oversees research and community-outreach projects focusing on the status of Latino families and neighborhoods and ways to improve their health, education, and well-being.

Institute for Structure and Nuclear Astrophysics

Director:

Ani Aprahamian, *Chair and Professor of Physics*

Telephone: (574) 631-7716
 Fax: (574) 631-5952
 Location: 124 Nieuwland Science Hall
 E-mail: nsl@nd.edu
 Web: <http://www.nd.edu/~nsl>

For more than 50 years, the University of Notre Dame has supported an active research program in the fields of low and medium energy experimental nuclear physics. This rich history continues today within the Institute for Structure and Nuclear Astrophysics (ISNAP).

Funded by the National Science Foundation, ISNAP is a three-accelerator laboratory with a broad program in low-energy nuclear physics. The research emphasis is on nuclear astrophysics, weak interactions and fundamental symmetries, nuclear structure, and nuclear reactions with radioactive nuclear beams (RIBs). The experimental work, which focuses on studying the impact of various aspects of nuclear structure on understanding the origin of the elements from stellar evolution to explosive scenarios, is carried out at the FN, KN, and JN Van de Graaff Accelerators at ISNAP's Nuclear Structure Laboratory.

Physics research in nuclear structure is focused on studies of dynamics, deformations, and bulk nuclear properties. Dynamics of nuclei include studies of

behavior as wide ranging as vibrational motion associated with tidal waves on the surface of the nucleus to giant resonances and rotational motion including chiral rotations as well as superdeformations. Understanding nuclear dynamics has many implications from the most fundamental issues related to nuclear forces to probing incompressibility of nuclear matter and therefore the properties of neutron stars. Theoretical approaches of many body quantum systems can also be applied more generally to mesoscopic systems or clusters of atoms, and quantum dots.

A pioneering focus in ISNAP has been the development and application of short-lived radioactive beams, and the associated study of the structure and reactions of nuclei at the very limits of particle stability. This includes investigations of the recently discovered "neutron halo" nuclei, exotic systems in which a cloud of nearly pure neutron matter at very low density surrounds a normal nuclear core. These nuclei can be a key for the onset of explosive nucleosynthesis mechanisms such as the r-process.

Measurements of nuclear reaction rates and decay processes at stellar temperatures and densities comprise a strong part of the experimental effort in nuclear astrophysics. The goal is to understand the origin and distribution of the elements in the universe. Research is directed towards simulating stellar nucleosynthesis in the laboratory, understanding late stellar evolution and explosive nucleosynthesis in novae and supernovae, and explaining the origin of the very high luminosity observed in stellar x-ray bursts.

Developing accelerator mass spectrometry techniques for a range of applications from oceanography to astrophysics is a new research focus of our laboratory. Accelerator mass spectrometry has traditionally been used to detect environment tracers at or below their natural abundance level with extremely high sensitivity. We seek to advance and exploit this technique at the local facilities for identifying new radioactive noble gas probes of oceanography and for the study of low cross-section nuclear reactions, which are important in stellar evolution.

Interdisciplinary Center for the Study of Biocomplexity

Director:

Mark Alber, *Professor of Mathematics and Concurrent Professor of Physics*

Telephone: (574) 631-4178
 Fax: (574) 631-6579
 Location: 255 Hurlley Hall
 E-mail: malber@nd.edu
 Web: <http://www.nd.edu/~icsb/>

Biocomplexity is the study of the complex structures and behaviors that arise from the interaction of biological entities (molecules, cells, or organisms). While physical and chemical processes give rise to a great variety of spatial and temporal structures, the

complexity of even the simplest biological phenomena is infinitely richer.

Members of the University of Notre Dame Interdisciplinary Center for the Study of Biocomplexity (ICSB) come from eight departments from the schools of science and engineering and are working together to meld physical, mathematical, and computational approaches with those of modern biology to understand this complexity in a quantitative and predictive way.

The main goal of the ICSB is to develop comprehensive multiscale models of cell and tissue organization and their relation to development. We address three scales of structure starting from the level of genetic control networks and including at the subcellular level, molecular machines and cytoskeletal and protein networks. At the cell level we emphasize cell polarity and cell-cell interactions. At the supercellular level our studies include the aggregation of cells into tissues and tissues into organs.

All ICSB projects combine quantitative experiments and computer simulation and build on the mutually complementary strength of the researchers at Notre Dame with the support from collaborators at Indiana University and other institutions. Projects currently under way within the center include:

1. Modeling organogenesis and tissue development, including the mechanical properties of tissues.
2. Modeling biological networks at the molecular level, including gene regulation pathways, transport and mechanical interactions in the cytoskeleton and intra- and inter-cell signaling networks.
3. Modeling cellular dynamic, including the mechanical properties of cells.
4. Population dynamics and ecological system

The ICSB also conducts international workshops essential to its training mission. Thus far ICSB has organized six such Biocomplexity Workshops, including "Multiscale Modeling in Biology," held in August of 2003, at the University of Notre Dame.

Joint Institute for Nuclear Astrophysics

Director:

Michael Wiescher, *the Frank M. Freimann Professor of Physics*

Telephone: (574) 631-6788
 Fax: (574) 631-5952
 Location: 255 Nieuwland Science Hall
 E-mail: wiescher.1@nd.edu
 Web: <http://www.jinaweb.org>

The Joint Institute for Nuclear Astrophysics (JINA) — a National Science Foundation (NSF) Physics Frontier Center — at the University of Notre Dame,

CENTERS AND INSTITUTES

Michigan State University, and the University of Chicago provides an intellectual center for the field of nuclear astrophysics with the goal to enable swift communication and to stimulate collaborations across field boundaries. Nuclear astrophysics focuses on questions at the interface between nuclear physics and astrophysics. It addresses the role of nuclear reaction processes as an engine of stellar evolution and attempts to find answers to the fundamental questions of the origin of the elements found today throughout the universe.

Because of the extreme nature of the stellar conditions, an understanding of these nuclear processes poses an enormous challenge to both nuclear theorists and experimentalists. Advances in experimental nuclear astrophysics now allow physicists to simulate and investigate many stellar processes in the laboratory. These studies require a wide range of techniques and facilities. They include innovative methods to measure the extremely slow reactions in the interiors of stars, as well as new facilities to produce the very same exotic, short-lived nuclei that come to existence in the extreme environments of stellar explosions. While JINA researchers are leading and/or collaborating in these kinds of experiments, they also seek to combine the experimental results with detailed theoretical simulations of rapid hydrodynamic processes in stellar evolution and stellar explosions. Through a broad collaboration with research centers at the Universities of Arizona and California, this interdisciplinary approach will drive further advances in the field through the development of new computational techniques. To move toward these advances, JINA will also organize a series of goal oriented workshops and conferences to offer the opportunity for the national and international research community to discuss the experimental, theoretical and observational results on a regular basis.

JINA also offers extensive training and outreach programs from kindergarten through graduate study to inform about the rapidly emerging scientific results and to stimulate interest for future generations of students and researchers in the field.

W.M. Keck Center for Transgene Research

Director:

Francis J. Castellino, *the Kleiderer-Pezold Professor of Biochemistry*

Telephone: (574) 631-9931
 Fax: (574) 631-8017
 E-mail: transgen@nd.edu
 Web: <http://www.nd.edu/~transgen>

The W.M. Keck Center for Transgene Research employs innovative genetic technology to study human diseases that involve blood clotting, anti-clotting, and clot-dissolving systems and related inflamma-

tory processes, such as heart disease, atherosclerosis, infection, and cancer. Established in 1997, the center brings together research in transgenic manipulations both locally, and with other laboratories around the world that possess special expertise in characterizing the genetically altered animals. The director's own laboratory at Notre Dame is considered among the foremost worldwide conducting basic biochemical and genetic research on blood clotting processes.

In establishing this sophisticated cutting-edge technology at Notre Dame, the center hopes to better understand how clotting systems function in a living organism, and how they relate to inflammatory processes at the gene level, in this case mouse models of disease. In transgene research, scientists alter genetic material in a very precise manner in an animal's embryo, either by adding, deleting, or exchanging certain genes in the few cells of the newly formed embryo. This changes the animal in every cell in its body, for its entire life span, and the changes will be handed down to future generations.

By breeding animals with differently altered genes, Notre Dame researchers expect to get a clearer view of the complex interplay of all genes involved in particular diseases. They are attempting to determine how these coagulation proteins function in a living organism; if the cells have some backup mechanism for clotting and clot dissolving; and if there are other processes within the animal, such as inflammation, atherogenesis (production of degenerative changes in arterial walls), tumorigenesis (production of tumors), spread of infection, and metastasis (the spread of malignant tumors), for example, that are affected as well.

Kellogg Institute for International Studies

Director:

Scott Mainwaring, *Eugene Conley Professor of Political Science*

Telephone: (574) 631-6580
 Fax: (574) 631-6717
 Location: 130 Hesburgh Center
 E-mail: kellogg@nd.edu
 Web: <http://www.nd.edu/~kellogg>

The Helen Kellogg Institute for International Studies promotes comparative international studies. Each year, Kellogg hosts about 15 residential visiting fellows and guest scholars from the United States and abroad. The institute also comprises about 60 faculty fellows, coming from numerous departments and other units around Notre Dame. It awards individual support for research to faculty and graduate students, and internships and grants to undergraduates. In support of intellectual exchange, Kellogg schedules a twice-weekly speaker series, conferences, round ta-

bles, current affairs panels and cultural events, and it disseminates research through publications. Through these activities, Kellogg fosters interdisciplinary, comparative social science research on contemporary political, economic, social, and religious issues in international affairs.

The institute emphasizes five major themes: *democratization and the quality of democracy; growth and development; public policies for social justice; religion and the Catholic Church; and social movements and organized civil society.*

The institute promotes research that is germane to major issues in the contemporary world, and its research on democracy attracts worldwide attention. Similarly, Kellogg's research on public policies seeks to influence not only academic debates, but also public policy discussions.

Kellogg researchers place special emphasis on Latin America, reflecting both the region's importance to the United States and Notre Dame's longstanding ties there. Despite its prominence on the institute's research agenda, Latin America does not command exclusive attention. Over time, Kellogg has fostered a growing range of research on other regions of the world while retaining the Latin American emphasis for which it is best known. Researchers at the institute seek thematic comparisons with Europe, Asia, and Africa.

From the outset, the institute has attempted to build bridges in innovative ways between the United States and Latin America and other regions, actively seeking balanced participation between its U.S. and foreign scholars. The institute collaborates with foreign social science centers in joint research projects and sponsors a continual interchange of ideas with scholars from Latin America and the world over.

Working groups provide a forum for thematically focused discussion among-fellows, visitors, outside speakers, graduate students, and the University community. These groups provide an opportunity for scholars to define and explore emerging research themes, shape the field of comparative international study, and even influence public policy choices.

Research Support for Graduate Students Kellogg plays an active role in support of graduate training without awarding degrees itself. The institute encourages graduate student involvement in research projects, working groups, and in its seminars and lectures. Many graduate students work as teaching assistants to professors who teach undergraduate courses. Regular interaction with Kellogg fellows, visiting fellows, and international conference participants keeps students abreast of international developments and the latest research trends.

Kellogg supplements departmental fellowships to attract Ph.D. students from Latin America, awarding a stipend of \$5,000 for each of five years to outstanding candidates.

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Financial assistance to other graduate students includes Foreign Language and Area Studies (FLAS) fellowships, seed money grants, and dissertation fellowships to support various stages of field research or the writing of doctoral dissertations. These grants have funded initial research in many countries and have helped graduate students to obtain external support at a later date. The winners of these competitive awards in 2003 included doctoral candidates working on topics such as re-examining the nuclear proliferation puzzle, political finance and party organizations in federal systems, and Catholic revival in a Chinese village.

For more information about dissertation fellowships and seed money grants for Notre Dame graduate students or about the supplemental fellowships for graduate students from Latin America, please contact Academic Coordinator Holly Rivers at (574) 631-6023 or hrrivers@nd.edu. For FLAS award information, contact Assistant Program Manager Juliana de Sousa Solis, at (574) 631-8523 or jdesousa@nd.edu. Also, see our Web site under Grants/Awards.

The Kellogg/Kroc Information Center (<http://www.nd.edu/~kic>) maintains a small collection focused on current events, including working papers, newsletters, and reference sources. Access to numerous electronic resources, including indices and full-text databases, is also available through the center.

Keough Institute for Irish Studies

Director:

Christopher B. Fox, *Professor of English*

Telephone: (574) 631-3555
 Fax: (574) 631-3620
 Location: 422 Flanner
 E-mail: irishstu@nd.edu
 Web: <http://www.nd.edu/~irishstu>

The Keough Institute for Irish Studies is an interdisciplinary project devoted to teaching and research in Irish culture, primarily in the English and Irish languages, and in all its internal and external relations. These relations include not only specific connections and comparisons with other cultures, but also recognitions, at both theoretical and empirical levels, of the various ways in which this field of study can be organized and illuminated in the light of contemporary theory. Ireland has an extraordinary tradition in literature (in both the Irish and English languages), a unique historical position in relation to British and European historical development, and an influence, disproportionate to its size, on the history of the United States.

On the Notre Dame campus, the Keough Institute hosts major conferences, which have included special conferences on the Famine and on the Great Irish Rebellion of 1798, cosponsored by the Irish government; a conference entitled "Partition and Memory: Ireland, India and Palestine," cosponsored

by the United States Institute for Peace; the American Society for Eighteenth-Century Studies; and North American Celtic Studies Association national meetings. In April 2005, the institute will host the national meeting of the American Conference of Irish Studies.

Graduate students in Irish studies are encouraged to participate in the regular bi-weekly faculty-graduate on-campus seminar series and in graduate workshops. Recent speakers have included Benedict Anderson, Ciaran Carson, Elizabeth Cullingford, Seamus Deane, John McGahern, Katie Trumpener, Marjorie Howe and David Lloyd.

The month-long Irish Seminar is held in Dublin, Ireland, every summer at the Notre Dame Keough Centre in Newman House. The Irish Seminar attracts participants from universities worldwide to participate in discussion and debate with major figures, including recent guests Seamus Heaney, Nuala Ó Faoláin, Stephen Rea and Edna O'Brien.

Funded opportunities allow students to participate in the Irish Seminar or advance their knowledge of Irish by studying in a joint program at the National University of Ireland (NUI)-Galway.

The core faculty in Irish studies at Notre Dame includes members of the departments of English, History, and Classics. The core faculty is also regularly supplemented by visiting scholars who come as fellows of the Keough Institute. Recent visiting professors have included Angela Bourke of University College Dublin, Thomas Bartlett of University College Dublin, Ciaran Brady of Trinity College Dublin, Joseph Cleary of St. Patrick's College-NUI, Terry Eagleton of Oxford University, Maud Ellman of Cambridge University, John Kelly of Oxford University and Margaret O'Callahan of Queen's University Belfast. Through the National Endowment for the Humanities, the Keough Institute also awards an annual fellowship to a visiting scholar to concentrate on research and writing while in residence.

The University's Hesburgh Library sustains advanced research in all areas of Irish Studies. Its rare special collections include the A. A. Luce Berkeley Collection, the William B. Todd Burke Collection, the 1798 Irish Rebellion and Act of Union Collection, the Grattan Collection of Irish Pamphlets, the O'Neill Collection of Irish Music, the Keough Vienken Collection of Swift, the David J. Butler Collection of Irish Maps, collections relating to eighteenth-century drama, the Abbey Theatre and the Cuala Press, and the massive Herbert Allen Keough Eighteenth-Century Microfilm Collection with over 200,000 eighteenth-century books, broadsides and other printed materials. Recent acquisitions include major collections in Irish language materials, the Goldsmith Kress Collection in Economic Literature and, through the new Irish Fiction Initiative and Smurfit Fund, the Loeber Collection of Irish Fiction. Containing many rare eighteenth- and nineteenth-century works, the Loeber collection is

the most comprehensive collection of Irish fiction in the world. Through major funding from the National Endowment for the Humanities and the ongoing Medieval Literature Initiative, the Notre Dame Medieval Institute in the Hesburgh Library also contains substantial collections that support Irish studies.

A graduate program in Irish language and literature may be pursued through the Ph.D. program in literature, and Irish studies through a doctoral program in English or history.

Joan B. Kroc Institute for International Peace Studies

Director:

R. Scott Appleby, *the John M. Regan Jr. Director and Professor of History*

Telephone: (574) 631-6970
 Fax: (574) 631-6973
 Location: 100 Hesburgh Center
 E-mail: krocinst@nd.edu
 Web: <http://www.nd.edu/~krocinst>

The Kroc Institute is founded on the belief that peace is inseparable from the resolution of violent conflicts and the promotion of social justice and equitable development. This comprehensive understanding of peace is rooted in the Catholic social tradition, a broadly ecumenical tradition of moral wisdom that stresses the necessity for justice in bringing about peace.

The institute's mission embraces both the prevention of violence or war, sometimes called "negative peace," and the building of cooperative, just relations between people, or "positive peace." Among the many college and university programs in peace and conflict studies, the Kroc Institute is a leader in addressing the political, cultural, religious, social, and economic factors that lay the foundation for positive peace.

The institute pursues its mission through innovative, interdisciplinary educational programs on the graduate and undergraduate levels. To foster research on peace, the institute sponsors visiting fellows, working groups, conferences, and guest lectures by scholars, policymakers, and peace practitioners. The institute publishes a semiannual Peace Colloquy, a series of occasional papers, and policy briefs on current issues.

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Themes

The Kroc Institute's educational and research programs are organized around four themes:

The role of international norms and institutions in peacemaking. Institute faculty and students search for ways to make intergovernmental organizations and other international institutions more effective and representative, and to increase compliance with fundamental norms of peace and human rights.

The impact of religious, philosophical, and cultural influences on peace. Through teaching and research, the institute explores the ethics of the use of force, the ways in which the world's religious traditions foment violence or encourage peace, the practice of nonviolence, the importance of philosophies of global justice, and the ingredients of cultures of peace.

The dynamics of intergroup conflict and conflict transformation. Students and faculty explore multidisciplinary understanding of the conditions that give rise to violent conflicts in order to identify local and international responses able to transform conflicts and encourage peacebuilding. All of the institute's conflict studies incorporate cross-cultural examination of key issues.

The promotion of social, economic, and environmental justice. Students and faculty interested in social change examine the role of individuals, non-governmental organizations, commercial enterprises, and states, in sustainable economic development and respect for human rights, and conflict transformation.

With more than 300 alumni from 70 countries around the world, the Kroc network of Notre Dame peacemakers is beginning to exert a truly uplifting influence in many local communities, in transnational civil society, and in policymaking circles. Approximately half of the institute's graduates pursue further graduate education, either in their home countries or in doctoral or professional programs in the United States, before accepting employment in intergovernmental and nongovernmental organizations or conducting peace research and education in academic institutions at home or worldwide. Graduates have also taken leadership roles in government agencies, church-sponsored international development and humanitarian projects, research institutes, and other peacemaking efforts around the globe.

For a description of the master of arts program in peace studies, please refer to the Division of Social Sciences section of this Bulletin.

Medieval Institute*Director:*

Thomas F. X. Noble, *the Robert M. Conway Director of the Medieval Institute and Professor of History*

Telephone: (574) 631-6603

Fax: (574) 631-8644

Location: 715 Hesburgh Library

E-mail: medinst@nd.edu

Web: <http://www.nd.edu/~medinst/>

The Medieval Institute, established in 1946 and located on the seventh floor of the Hesburgh Library, is a center of research and advanced instruction in the civilization of the Middle Ages, with particular strengths in religious and intellectual history, Mediterranean civilization, Old and Middle English, medieval Latin, theology and philosophy, Dante studies, medieval musicology, and liturgy. The graduate studies curriculum combines programmatic interdisciplinary course work, training in the technical skills of medieval studies, and linguistic preparation.

The institute's library contains more than 95,000 volumes and various collections of pamphlets, reprints, and photographic materials. The reference collection contains major primary source collections, bibliographic and reference materials, catalogues, journals, and indexes.

The institute's library has long held extensive collections relevant to the Latin culture of the Middle Ages. Holdings in the history of medieval education are unrivalled in North America. Recently, the institute has enlarged its focus to include vernacular and Latin literatures, musicology, liturgy, medieval Judaism and Islam, and art history. Microfilms of more than 3,000 medieval manuscripts from European libraries and a collection of more than 200 facsimiles of medieval seals supplement this collection. Over the years the institute has accumulated a valuable collection of medieval manuscripts, incunabula, and other manuscripts, and rare books that are preserved in the Department of Special Collections. Also found there is the John Augustus Zahm, C.S.C., Dante Collection containing early and rare editions and an extensive and valuable set of literary studies of the *Divine Comedy* from the 19th and early 20th centuries. Recently, the institute acquired 90 medieval coins, likewise housed in Special Collections.

What sets Notre Dame's institute apart is its convenient gathering in one place of most of the printed materials essential to medieval studies. The Reading Room holds major dictionaries, bibliographical guides, reference works, and primary source collections. The Astrik L. Gabriel Universities Collection in a separate room offers remarkable resources, both published and unpublished, for the history of medieval universities. The institute's Paleography Room contains an extraordinary collection of catalogues, facsimiles, and reference tools to assist research on manuscripts.

Research in the institute is also supported by the University's Milton V. Anastos Collection in Byzantine studies, which has extraordinary holdings in the intellectual history of the Byzantine empire.

The Frank M. Folsom Ambrosiana Microfilm and Photographic Collection consists of microfilms of the 12,000 medieval and Renaissance manuscripts held in the Biblioteca Ambrosiana in Milan. The collection also contains about 50,000 photographs and negatives of miniatures and illuminated initials from the manuscripts, supplemented by some 15,000 color slides. The Mary Davis Drawings Collection contains photographs, negatives, and color slides of the 8,000 drawings in the Ambrosiana. The institute purchases all volumes related to the Ambrosiana materials and maintains a bibliography of all citations to Ambrosiana manuscripts.

The institute regularly sponsors major conferences and hosts a variety of guest lectures and seminars every year. In fall 2002, the institute inaugurated the Conway Lectures, an annual series of three lectures delivered by a distinguished medievalist and published under institute auspices.

For a description of the Master of Medieval Studies and Doctor of Philosophy programs in medieval studies, please refer to the Division of Humanities section of this *Bulletin*.

Nanovic Institute for European Studies*Director:*

James McAdams, *the William M. Scholl Professor of International Affairs*

Telephone: (574) 631-5253

Fax: (574) 631-3569

Location: 211 Brownson Hall

E-mail: nanovic@nd.edu

Web: <http://www.nd.edu/~nanovic>

The Nanovic Institute has been at the intellectual crossroads of European studies at Notre Dame since its founding in 1993. The institute has particular interest in the ideas, institutions, and values that have shaped the European experience over the past two centuries. Through grants and program support, the institute seeks to bring together faculty and students with interests in both the humanities and the social sciences. By focusing on issues of importance to Europeans today—the nation-state and beyond, liberalism and its critics, secularism in the contemporary world, and the ongoing crisis of modernity—the Nanovic Institute provides an interdisciplinary home for fields of inquiry as wide-ranging as theology, politics, philosophy, literature, history, and the arts.

The Nanovic Institute's many faculty fellows organize campus events (including conferences, lectures, and film series) to promote European studies at Notre Dame. Comprehensive grant programs for students and faculty support research and teaching.

CENTERS AND INSTITUTES

The institute directly involved in Notre Dame's growing activities in Europe and the University's mission in this crucial region of the world.

Radiation Laboratory

Director:

Dan Meisel, *Professor of Chemistry and Biochemistry*

Telephone: (574) 631-5457

Fax: (574) 631-8068

E-mail: dani@nd.edu

Web: <http://www.rad.nd.edu>

The Radiation Laboratory is a University institute and a government-owned facility of the U.S. Department of Energy, a member of the network of national laboratories spread across the country. The mission of the laboratory is to study chemical reactions initiated by light or ionizing radiation. Such studies provide the fundamental underpinnings for energy science and technology development in areas as diverse as solar energy conversion, nuclear energy, and environmental management. Because of its broad applicability, research in the laboratory is frequently the subject of interdisciplinary projects involving faculty and students in various areas of science and engineering.

The Radiation Laboratory's research programs are principally conducted by members of the University's faculty aided by students of all levels, postdoctoral fellows, and visiting scholars from around the world. Several members of the laboratory faculty are also professors in academic departments. Scientists at the Radiation Laboratory conduct research in collaboration with faculty members. Graduate students are accepted as members of the laboratory on recommendation by their faculty and Radiation Laboratory research advisers. Graduate students frequently are supported financially by Radiation Laboratory research fellowships during the development of their doctoral dissertations.

The Radiation Laboratory operates from its own building that houses many special facilities developed for the study of the effects of light and radiation. Three electron accelerators are housed in underground vaults adjacent to the main laboratory building. These accelerators include an 8-million-electron-volt (MeV) linear accelerator used to study chemical and physical processes occurring at nanosecond or longer times; a 2 MeV Van de Graaff accelerator used in studies of Raman spectroscopy of short-lived radicals and electronically excited molecules; and a 3 MeV Van de Graaff dedicated to studies of electron spin resonance of intermediates produced during radiation chemical processes. In addition, the laboratory has three cobalt sources (⁶⁰Co) for irradiation rated at sixteen, four, and one kilocuries.

Studies with visible and ultraviolet light are carried out using many different types of light sources. These include several nitrogen lasers, dye lasers, excimer lasers, and high-intensity YAG lasers capable of producing light pulses as short as 10-11 sec, for irradiation in the visible and ultraviolet regions. Facilities are available for study of radiation processes at high pressures and very low temperatures. Analytical facilities include various types of spectrophotometers, electron-spin-resonance (ESR) spectrometers, a Raman spectrograph for time-resolved studies, high-resolution Raman spectrograph/microscope, spectrofluorimeter and fluorescence lifetime apparatus, gas and liquid chromatographs, capillary electrophoresis, an ion chromatograph, a mass spectrometer, a differential scanning calorimeter, a Fourier-transform infrared spectrometer, light-scattering and electrochemical apparatus, and other similar types of equipment. A state-of-the-art Atomic Force Microscope operates in the laboratory to characterize materials on the nanometer scale and near-field-scanning microscopy capabilities are currently under development. A transmission electron microscope is also available at the Rad Lab. Computer facilities support research programs in theoretical chemistry and kinetic modeling. The laboratory operates its own glass, electronics, graphics, and machine shops.

The Radiation Laboratory is home to the Radiation Chemistry Data Center, which provides the international scientific, engineering, and industrial communities with bibliographic and numeric databases on topics of importance to the fundamentals of energy generation and environmental management.

John J. Reilly Center for Science, Technology, and Values

Director:

Gerald P. McKenny, *Associate Professor of Theology*

Telephone: (800) 813-2304

Fax: (574) 631-3985

Location: 346 O'Shaughnessy Hall

Web: <http://www.nd.edu/~reilly>

The John J. Reilly Center for Science, Technology, and Values is committed to advancing the understanding of science and technology as human, knowledge-producing endeavors, and the variety of ways these rapidly changing institutions have an impact upon and are affected by society at large.

In keeping with the University's mission as a preeminent Catholic university, the center seeks to make a distinctive contribution to the humanistic understanding of science and technology. It supports outstanding scholarship in the fields of science and technology studies. Through conferences and publications emphasizing the complementary roles of scientific, technological, ethical, and theological perspectives, it facilitates broad public dissemination of outstanding work reflecting these viewpoints. Within the Notre

Dame community, the center endeavors to foster a greater awareness of the significance and complexity of interactions among science, technology, and society.

Activities pursued at the center fall under the headings of academic programs and research (including support of conferences and publications).

Academic Programs

The Reilly Center provides administrative support and a campus "home base" for three very different educational programs:

The *Graduate Program in History and Philosophy of Science* (HPS), established in 1989, offers courses of study leading to both the M.A. and Ph.D. degrees. It provides advanced training primarily for students intent on a career of teaching and scholarship at the college and university level. The program relies on the expertise of more than 20 faculty representing six University departments, making it one of the larger research groups in this field in the United States.

The undergraduate *Minor Program in Science, Technology, and Values* (STV) is available to all undergraduates at the University regardless of their major field of study. Courses are organized around such themes as technology and public policy, history and philosophy of medicine, science and religion, environmental science and ethics, biotechnology and society, and medical ethics.

The *Five-Year, Double Degree Program in Arts and Letters/Engineering* enables students to earn two undergraduate degrees in 10 semesters of course work. It provides a select group of students the opportunity to combine the values of an intensive liberal arts education with their professional training in engineering.

Research: Conferences, Lectures, and Publications

The center regularly brings to campus distinguished speakers to lecture on topics relevant to the interests of students and faculty involved in all of its academic programs. This includes a major speaker series in the History and Philosophy of Science (HPS), bringing to campus eight or more well-known scholars every year. The center also sponsors activities and lectures specifically devoted to applied science and technology and to their social and ethical implications. Issues pertaining to risk assessment, the environmental crisis, current issues in biotechnology, medical ethics, and science and religion have all been the subject of lectures or panel discussions recently, as have computer ethics and nuclear weapons control.

Over the years, the Reilly Center and HPS Program have cosponsored several major academic conferences. The most recent events have included "The Need for a New Economics of Science," which examined the changing economic relations of science

CENTERS AND INSTITUTES

and funded research; a major international conference held on "Galileo and the Church;" and a joint conference on science and values, cosponsored by the HPS programs at Notre Dame and the University of Bielefeld (Germany). Proceedings of major conferences are made available as volumes in the series *Studies in Science and the Humanities from the Reilly Center*, published through the University of Notre Dame Press. In addition, smaller conferences are sponsored on an occasional basis.

South Bend Center for Medical Education

Acting Director:

John F. O'Malley, *Adjunct Associate Professor of Biological Sciences*

Telephone: (574) 631-5574
 Fax: (574) 631-7821
 Location: B-22 Haggar Hall
 E-mail: sbcme.1@nd.edu
 Web: <http://galen.sbcme.nd.edu>

The South Bend Center for Medical Education is one of eight centers for medical education in the Indiana University Medical School system. The center offers the first- and second-year program in medicine and participates in programs leading to a master's and a doctoral degree in biomedically oriented sciences in conjunction with the Notre Dame Graduate School.

Although all students in the center's programs are registered in the University of Notre Dame, admission to the medical program is a function of the Indiana University Medical School, and applications should be directed to its admissions office. Admission to biomedical graduate programs is a joint function of the center and the several cooperating departments of the Graduate School. Application for these programs should be made to the Office of Graduate Admissions.

At present, biomedically oriented graduate programs in which the center plays a conspicuous role are offered in the areas of human anatomy, human physiology, and neuroscience. The student's major adviser for these programs is chosen from the center faculty, and the student's committee is composed of faculty from the center and the appropriate graduate departments.

A unique M.D./Ph.D. program is available to outstanding students. These students are admitted simultaneously to the Indiana University School of Medicine and the University of Notre Dame Graduate School. The M.D./Ph.D. program is described in the Division of Science section of this *Bulletin*.

Students interested in this program should contact the office of the director, South Bend Center for Medical Education. Other graduate students may take courses in the center subject to approval of the course instructor, the center director, and the home department of the student, and subject to the availability of space in the desired course.

Walther Cancer Research Center

Director:

Rudolph M. Navari, M.D., *Associate Dean, College of Science*

Telephone: (574) 631-9931
 Fax: (574) 631-4939
 Location: 250 Nieuwland Science Hall
 E-mail: wcc@nd.edu
 Web: <http://cancerresearch.nd.edu>

The Walther Cancer Research Center is a collaboration between the University of Notre Dame and the Walther Cancer Institute, a private nonprofit research organization affiliated with major universities and medical institutions. The Walther Cancer Center's activities include a wide variety of specific areas including cell biology, biochemistry, drug design, clinical oncology, and patient care. The center emphasizes collaboration and communication among its members in order to maximize the transfer of information between the laboratory and the clinic.

The specific objectives of the research center at the University involve four major areas of investigation: the molecular biology and gene targeting program, the cell biology and cell signaling program, drug design and development, and clinical oncology.

The molecular biology and gene targeting program utilizes transgene technology to develop mice with either delayed expression or expression of mutated forms of proteins. These technologies permit the study of the relative contribution of components of the coagulation and fibrinolytic systems in various stages of cancer and methods to potentially identify new therapeutic regimens.

The cell biology and cell signaling program studies the mechanisms and regulation of cell proliferation, cell motility, angiogenesis, apoptosis, and transformation. Using a variety of cancer cell culture systems and techniques, an *in vitro* assessment of cell proliferation, cell death, invasion, and migration is carried out with an emphasis on the biology of hormone-dependent cancers, experimental therapeutics, and hormone resistance.

The drug design and development program investigates the synthesis and the structural details of various potential chemotherapeutic agents as well as their interaction with biological receptors at the molecular level. The structural characterization is accomplished using high-field nuclear magnetic resonance mass spectroscopy and X-ray crystallographic techniques.

The clinical oncology program studies the doctor-patient relationship with the goal of improving communication in the areas of truth telling, confidentiality, informed consent, decision making, and end-of-life care. Current studies include the development of an educational intervention for patients with a new cancer diagnosis, the development of new antiemetics, antibiotic use in hospice care, and palliative care.

The 21 faculty in the Walther Cancer Center are members of the departments of biological sciences and chemistry and biochemistry.