Special Academic Opportunities

The programs described here are in addition to those offered through the academic colleges outlined in the following section. Taken together, they describe the full range and variety of MSU’s academic opportunities.

General Studies Program

The General Studies Program fulfills a variety of interests and needs at MSU-Bozeman. Most typically, freshmen choose General Studies when they are uncertain about a major field of study or want to explore a variety of curricula before making a final choice. Almost one-third of entering freshmen choose General Studies as their initial curriculum.

Based on the student’s interests and predicted abilities, a General Studies academic adviser will help the student prepare an individualized program to explore various areas and at the same time fulfill course requirements or electives in any curriculum. Required University Core courses are particularly suited for General Studies students.

General Studies students have the opportunity to enroll in a freshman seminar, an academic core course which helps them understand their role in the university and fosters structured career exploration, academic planning, and goal setting.

Undergraduate students may take up to 60 semester credits (through the sophomore year) in General Studies before declaring a major; although they are encouraged to select a suitable degree plan well before the 60-credit limit.

The program also serves students who plan to pursue specialized degrees at other institutions but wish to take basic courses at MSU-Bozeman for one or two years before transferring.

Transfer students with fewer than 60 credits may enter General Studies to fulfill requirements before declaring a major.

Students registering in General Studies will be advised by General Studies advisers until they either transfer to a degree curriculum or leave the institution. Their records will be maintained in the General Studies Office, 418 Reid Hall, 406-994-3532.

Those interested in a health profession can visit the Pre-Health Professions Advising Office in General Studies. The pre-health adviser can help students select a health profession or, for those who already have a profession in mind, guide students through the undergraduate course requirements and the application process for professional schools.

University Honors Program

University life serves many ends, but the primary purpose of higher education is to prepare students to think for themselves. Undergraduate education in particular has the goal of helping students become, in time, their own best teachers. At Montana State University-Bozeman, the University Honors Program addresses this goal by providing academically motivated students with unique opportunities to undertake interdisciplinary coursework and undergraduate research leading to a university honors degree. Such studies, in addition to disciplinary course work, provide extraordinary preparation for professional and technical careers, or graduate and advanced studies.

Honors Seminars constitute the heart of the program. Faculty and students together engage in critical discussion of issues and topics which cut across the diverse range of traditional departmental subjects. Teaching is primarily Socratic: emphasis is placed upon class discussion rather than lectures. Considerable attention is given to the development of analytic and critical skills and expression of them through speaking and writing. Entering students have the opportunity to undertake innovative interdisciplinary studies during their freshmen year. Texts and Critics: An Introduction to Knowledge and Imagination, is a course addressing fundamental issues in the humanities, social sciences, science, and the arts through critical reading and analysis of seminal books which are the foundation texts of advanced studies in all the major discipline fields. Taught by faculty representing every college at the University, Texts and Critics earns University Core credits in oral communication and the humanities. In addition, the Honors Program annually offers a variety of seminars for sophomores and upperclass students. These upper-division seminars may also earn University Core credit in each of the major discipline categories. These seminars, typically taught by the most respected and stimulating faculty on campus, are interdisciplinary and focus on selected topical subjects.

Honors Sections of chemistry, physics, math, English and economics are offered through these departments as enriched versions of regular courses. Limited enrollments in seminars and sections permit intensive study and discussion. Honors sections satisfy University Core requirements.

Great Expeditions is an Honors course that includes a two-week guided class journey at home or abroad as a culmination of reading and discussing the journal of an expedition. After the journey is completed, students present a public symposium highlighting the results of their expedition.

Additional opportunities for independent study are available through Honors contracts, which are taken primarily at the upper-division level. Contracts allow students to work with a specific faculty member, either in a class, in small groups or individually, on research projects. Contracts often prepare students to accept the special challenges and benefits of an Honors thesis. Finally, selected upperclass students may qualify to undertake supervised study under a program of reading tutorials.

Participants in the University Honors Program benefit from the individualized instruction and class discussion that are characteristics of the program. In addition, Honors students are eligible for Honors scholarships and have been unusually competitive in the award of other scholarships for further study, both in the United States and abroad. Special attention is given to preparation for professional and graduate schools.

Extracurricular, outdoor, and social activities are an important feature of the daily life of the program.
Enrollment in University Honors Program courses is generally restricted to students officially enrolled in the Honors Program. Admission to the program is determined by its director according to guidelines approved by the University Honors Program Advisory Committee. Generally, admission is limited to students who demonstrate high academic achievement and personal initiative. Graduation in Honors requires 16-28 credits in Honors courses, all of which can be core curriculum Honors courses; a minimum 3.5 overall grade-point average; and one year or its equivalent of one foreign language. To graduate with highest distinction, a thesis and a minimum 3.7 GPA is required. Students with energy, self-reliance, and imagination are encouraged to discuss their interests with the director. To maintain good standing in the program, Honors students must demonstrate significant and continuing progress toward their specific degree in addition to satisfying the particular standards of Honors coursework or research. For details about admission and graduation requirements, contact the University Honors Program Office in Quad D by calling 406-994-4110 or sending e-mail to zuh7001@montana.edu.

Directed Interdisciplinary Studies

For undergraduates interested in pursuing an area of scholarly/creative inquiry that falls outside the established departmental structure of Montana State University-Bozeman, a bachelor's degree program in Directed Interdisciplinary Studies has been approved by the Regents of the Montana University System. Directed Interdisciplinary Studies (DIS) is not a "double-degree" nor a "major-minor" degree program. Interdisciplinary study is defined as the integration of more than one intellectual or methodological perspective on a problem (or set of related problems) identified by the student and approved by the Faculty Advisory Committee (FAC) consisting of three or more faculty members representing at least three different cate-
gories and two different disciplines. DIS majors are required to meet with their FAC as a whole each semester and to file a progress report each semester. Appropriate projects will be those which represent an interdisciplinary focus and a culmination of the approved course of study. A DIS major will represent an intellectually coherent sequence of coursework, seminars, and supervised reading/research projects culminating in a substantial written and/or creative senior year thesis.

Applicants must have a university grade point average of 3.00 and a letter of reference from the advisor chosen from the Faculty Advisory Committee attesting to the applicant's self-motivation. No B.A. or B.S. DIS degree will be awarded that includes less than 45 semester credit hours of DIS coursework, nor less than 36 semester system credit hours at the upper-division course level at Montana State University-Bozeman. A minimum of 120 semester credit hours is required for graduation. Courses in the DIS major with grades of D or F will not be counted toward the major. (The senior year thesis project must represent at least 9 semester credit hours at the upper-division course level. A final oral presentation of the thesis will be presented before the FAC and members of the DIS Oversight Board.) Applicants may be required to take more than 45 credit hours if determined by the DIS Oversight Board in conjunction with the student's Faculty Advisory Committee. Students will not be eligible for the DIS degree unless they have also satisfied the Montana State University Core Curriculum requirements.

Upon satisfaction of the requirements established for each DIS student by the DIS Oversight Board and approval of the student's college, DIS students will be recommended to the President of Montana State University and the Board of Regents for the B.A. or B.S. in Directed Interdisciplinary Studies (with citation of thesis and GPA honors as determined by established Montana State University-Bozeman regulations). For details about admission and an application, contact the University Honors Program Office in Quad D or call 406-994-4110 or send an e-mail to zuh7001@montana.edu.

WWAMI Medical Program

Montana State University-Bozeman is one of six universities participating in a program to decentralize medical education in five states: Washington, Wyoming, Alaska, Montana and Idaho (WWAMI). The WWAMI Program is supported by the State of Montana and guarantees that 20 qualified students can be admitted to the University of Washington School of Medicine each year. The WWAMI Program does not involve premedical (undergraduate) education.

Sponsored by the University of Washington School of Medicine at Seattle and leading to an M.D. degree from that school, the program is designed to make medical education available to citizens of the Northwest and to educate medical students in a way that will encourage them to practice primary care medicine in areas that lack sufficient physicians.

Students receive the first year of their medical education at the participating university in their state. The curriculum at each school is similar to and compatible with the University of Washington School of Medicine curriculum which emphasizes an integration of the basic and clinical sciences.

Course subject matter at Montana State University-Bozeman includes human anatomy, histology, human physiology, medical biochemistry, introduction to clinical medicine, pathology, immunology, infectious diseases, behavioral systems, the nervous system, and gross and micro anatomy. A clinical preceptorship program has been developed which involves the students with local physicians for several hours each week and for four weeks during the summer.

Following this first year of study at one of the peripheral universities, students join the portion of the class that began their studies in Seattle at the University of Washington.

At the conclusion of the first two years, students enter the phase of their education which is predominantly clinical in nature. During this phase, students receive a portion of their training at the University of Washington School of Medicine and a portion of their clinical education from physicians in the communities where the physicians live and practice (community phase). These latter "Community Clinical Units" are
American Indian Research Opportunities (AIRO)

AIRO, a consortium of Montana's seven Tribal Colleges and MSU-Bozeman established in 1983, is dedicated to increasing the numbers of American Indians entering higher education and career fields where they are significantly underrepresented. AIRO is the umbrella organization for several specialized programs including the Initiative for Minority Student Development (IMSD) and the Montana (High School) Apprenticeship Program (MAP). All programs are funded wholly or in part by the federal government through such agencies as the National Institutes of Health (NIH) and the National Science Foundation (NSF). The major goal of AIRO is to provide opportunities for American Indian students in science, mathematics, engineering and technology (SMET) career fields. Through AIRO, American Indian students have the opportunity to excel and to serve as role models for other minority students. Descriptions of the programs administered under the consortium of AIRO are as follows.

- The IMSD Program focuses on undergraduate students. The program's major goals are (1) to increase American Indian students' academic competency in the biomedical fields, (2) to provide laboratory experiences in biomedical research for American Indian college-level students interested in biomedical/allied health careers, (3) to expose American Indian students to a broad spectrum of career opportunities in biomedical/allied health fields, (4) to strengthen facilities and research resources at the Tribal Colleges, and (5) to increase the number of American Indians in the biomedical/allied health fields.

- MAP is a summer enrichment program on the MSU-Bozeman campus for disadvantaged high school students who are interested in science and math and want to work in a research lab and live on a college campus. Over 85 percent of the students who have attended MAP in the past 15 years have gone on to college, many in science, math or engineering. The program also provides opportunities for middle and high school math and science teachers who work with disadvantaged students. The teachers spend 8-10 weeks on campus working in research labs and interacting with the MAP students.

For more information contact AIRO, 312 Roberts Hall, 406/994-5567, or e-mail: slyoung@montana.edu.

The Center for Native American Studies has assumed a uniquely broad responsibility to serve a number of constituencies. In doing so, it is committed to a balance in its four major roles: teaching, research, public service, and student services. In its academic program, the Center provides concentrated study through a minor in Native American Studies, as well as opportunities for students to gain a multicultural perspective in pursuing a general education through the University's Core curriculum. The Center, through its research and other creative efforts, actively pursues interdisciplinary scholarship in the field of Native American Studies. At the same time, the faculty seeks opportunities to develop programs which address the needs of its campus and off-campus constituencies. In its service function, the Center has a special responsibility to Indian tribes, communities, and organizations to assist self-directed educational, socioeconomic, cultural, and community development. In addition to fulfilling the traditional role of an academic unit, the Center for Native American Studies also assumes a commitment to the educational advancement of Indian people and in doing so, the Center performs a vital student service function to increase the academic achievement and retention of Native American students at Montana State University.

The Center for Native American Studies reflects an Indian voice in the University's teaching, research and service functions. In pursuing its mission and goals, the Center will continue to serve as a vital link between the University and Indian people.

Academic Program

The Center offers an interdisciplinary program of study in American Indian culture and history, policy and law, community affairs, education, and other related areas. The academic program provides concentrated study through a minor in Native American Studies, as well as opportunities for students to gain a multicultural perspective in meeting the University's Core curriculum requirement. The program is flexible enough to meet individualized needs of students and tribes by affording opportunities for independent study, internships, and special topics courses.
Research and Creative Activity

The Center takes pride in the scholarship of its faculty. Over the years faculty members have consistently published in professional journals, delivered papers at national and international meetings, and, by invitation, have chaired and participated in panels at national professional association conferences.

Consistent with its service commitment to Montana’s tribal communities, much of the faculty’s research and creative activity responds to the educational, cultural, and economic development needs of Native Americans.

In addition to scholarly research, faculty members have devoted much time and energy to developing new programs and finding external funding sources for those programs. During the past decade, the Center has received more than $5 million in federal, state, and private grants for programs which include graduate fellowships, tribal college development projects, international student exchanges, pre-college engineering and business programs, and national and international cultural development programs.

Service

The Center firmly maintains that Montana State University must be responsive to Indian communities in addressing tribally-identified educational, cultural, and economic development needs. Accordingly, the Center has directed much of its public service activity to Montana’s Indian communities. In doing so, Center faculty members have established close working relationships with tribal and intertribal groups as well as with national Indian offices and organizations.

Upon request, faculty members have also provided technical assistance in the areas of adult, vocational, and community college development; needs assessments; proposal writing; and program evaluations.

Utilizing the resources of the University to assist the development of Montana’s seven tribally-controlled community colleges has been a major goal of the Center. For example, the Center has administered projects to provide graduate-level training to tribal college faculty, to provide in-service training and technical assistance, and to conduct significant research in areas of importance to the tribal colleges.

In addition, faculty members have presented continuing education workshops on Montana reservations, evaluated reservation cultural and education programs, and provided other public service.

Faculty members have also, by invitation, read proposals for the U.S. Office of Education, the National Endowment for the Humanities, the National Institute of Education, and the National Science Foundation.

American Indian Student Programs and Services

In addition to the traditional functions of an academic department, the Center for Native American Studies places a high priority on providing student support programs and services, reflecting a strong commitment to Indian student retention and success. The student who decides to attend MSU will find a University-wide commitment manifested by a varied and extensive support system which is unequaled in the Great Plains region.

Mountain Research Center

The Mountain Research Center’s (MRC) mission is to develop, synthesize, and disseminate knowledge on the natural and interrelated cultural factors influencing the future of montane ecosystems. The Center utilizes the power of multidisciplinary research, education, and outreach to advance understanding of the physical and biological processes that characterize mountain ecosystems, as well as the role of humans in these ecosystems. Gaining this understanding is particularly important, inasmuch as human environments, and especially the Greater Yellowstone Ecosystem in which the MRC is located, represent some of the last large-scale vestiges of natural ecosystems in temperate zones of the world.

National Student Exchange

The National Student Exchange, a consortium of over 162 state-supported colleges and universities, offers students the opportunity to attend another participating institution for up to one academic year. By bringing together students from different parts of the country, the exchange encourages participants to broaden themselves academically, socially and culturally. Through a simplified admissions process, students are able to enroll at their host institutions with the same financial benefits enjoyed by in-state residents. Credits and grades earned on exchange are recorded at Montana State University-Bozeman as part of the students’ regular transcripts.

To qualify for participation in the program, a student must 1) be a full-time student; 2) have a minimum cumulative grade-point average of 2.5; and 3) be a student in good standing.

Students with Montana residency (in state) are able to enroll at their host institution with the same financial benefits enjoyed by in-state students. Nonresident students (out of state) may attend schools that allow them to continue to pay their tuition at Montana State University-Bozeman.

Colleges and universities participating in the National Student Exchange program include:

- Alabama A&M University
- Alabama State University
- Ball State University (Indiana)
- Binghamton University (New York)
- Boise State University (Idaho)
- Bowie State University (Maryland)
- Bowling Green State University (Ohio)
- Bridgewater State College (MA)
- California State Polytechnic University-Pomona
- California State Polytechnic University-San Luis Obispo
- California State University-Bakersfield
- California State University-Chico
- California State University-Dominguez Hills
- California State University-Fresno
- California State University-Hayward
- California State University-Los Angeles
- California State University-Northridge
- California State University-San Bernardino
- California University of Pennsylvania
- Central Washington University
- Cleveland State University (Ohio)
- College of Charleston (SC)
- East Carolina University (North Carolina)
- East Central University (Oklahoma)
- East Stroudsburg University (Pennsylvania)
- East Tennessee State University
- Eastern Arizona University
- Eastern Connecticut State University
- Eastern Michigan University
- Eastern Oregon University
- Florida International University
- Fort Hays State University (Kansas)
- Fort Lewis College (Colorado)
- Grambling State University (Louisiana)
- Howard University (District of Columbia)
- Humboldt State University (California)
- Hunter College of CUNY (New York)
- Idaho State University
- Illinois State University
- Indiana University of Pennsylvania
- Indiana University-Purdue University at Fort Wayne
- Inter American University of Puerto Rico, San German
- Iowa State University
- Johnson State College (Vermont)
Special Academic Opportunities

- Morehead State University (Kentucky)
- Mississippi State University
- Marshall University (West Virginia)
- Mankato State University (Minnesota)
- Keene State College (New Hampshire)
- Northeastern Illinois University
- Murray State University (Kentucky)
- Michigan Technological University
- San Francisco State University
- Ramapo College of New Jersey
- Oregon State University
- Northern State University (South Dakota)
- Northern Arizona University
- North Carolina State University
- Northern Arizona University
- North Carolina Central University
- Northwestern Illinois University
- Northern Arizona University
- Northern State University (South Dakota)
- Oklahoma State University
- Oregon State University
- Portland State University (Oregon)
- Rhode Island College
- Rutgers College, Rutgers University (New Jersey)
- San Francisco State University
- San Francisco State University
- San Jose State University (California)
- Sonoma State University (California)
- South Carolina State University
- South Dakota State University
- Southern Oregon University
- Southern University (Louisiana)
- Southwest Texas State University
- St. Mary's College of Maryland
- SUNY College-Buffalo (New York)
- SUNY College-Plattsburgh (New York)
- SUNY College-Potsdam (New York)
- SUNY University-Sunny Brook (New York)
- Tennessee State University
- The College of New Jersey
- Towson University (Maryland)
- Tuskegee University (AL)
- Universidad Del Sagrado Corazon (Puerto Rico)
- University of Alabama
- University of Alaska-Anchorage
- University of Alaska-Fairbanks
- University of Alaska Southeast-Juneau
- University of Arizona
- University of Central Florida
- University of Connecticut
- University of Georgia
- University of Guam
- University of Hawaii-Hilo
- University of Hawaii-Manoa
- University of Idaho
- University of Louisville (Kentucky)
- University of Maine
- University of Maine at Farmington
- University of Maine at Fort Kent
- University of Maryland-College Park
- University of Massachusetts-Amherst
- University of Massachusetts-Boston
- University of Memphis (Tennessee)
- University of Minnesota-Twin Cities
- University of Missouri-Columbia
- University of Missouri-St. Louis
- University of Nebraska-Kearney
- University of Nevada, Las Vegas
- University of Nevada, Reno
- University of New Hampshire
- University of New Mexico
- University of New Orleans (Louisiana)
- University of North Carolina at Wilmington
- University of North Texas
- University of Northern Colorado
- University of Northern Iowa
- University of Oregon
- University of Puerto Rico (Bayamon, Cavy, Humacao, Mayaguez, and Rio Piedras)
- University of Rhode Island
- University of South Carolina
- University of South Dakota
- University of Southern Colorado
- University of Southern Maine
- University of Tennessee at Chattanooga
- University of Texas-El Paso
- University of Texas-San Antonio
- University of Utah
- University of the Virgin Islands
- University of Washington
- University of West Florida
- University of Wisconsin-Eau Claire
- University of Wisconsin-Green Bay
- University of Wisconsin-Platteville
- University of Wisconsin-River Falls
- University of Wisconsin-Whitewater
- University of Wyoming
- Utah State University
- Virginia Commonwealth University
- Virginia State University
- Virginia Tech
- Washington State University
- Wesleyan College
- West Chester University of Pennsylvania
- West Virginia University
- Western Carolina University (NC)
- Western State College (Colorado)
- Western Washington University
- Westfield State College (Massachusetts)
- Wichita State University (Kansas)
- William Paterson College of New Jersey
- Winthrop University (South Carolina)

For more information about the National Student Exchange, contact General Studies, 418 Reid Hall, 406-994-3532, plane@montana.edu.

International Education

Office of International Programs

Responding to fundamental trends of the 1990's which pull the United States and Montana into the global marketplace and put us into daily contact with other nations, Montana State University-Bozeman seeks to bring international education to the core of the academic and cultural life of the campus. The Office of International Programs (OIP), located at Culbertson Hall (Fourth Floor), offers a full range of international programs and services to MSU students, faculty, and staff.

In today's world, every student, regardless of his or her major, needs to develop knowledge of other cultures and languages in order to succeed. OIP provides quality educational opportunities abroad for MSU-Bozeman students at 220 universities in 50 countries. In OIP's International Opportunities Resource Center, MSU students can obtain professional study-abroad advising and detailed information about study-abroad programs which will serve their specific needs.

OIP also offers services and programs which make MSU accessible to capable students from around the world and ensure they have worthwhile academic experiences. These services include professional international student advising, English as a Second Language (ESL) instruction (see ACE Language Institute), and activities which integrate MSU's international students and scholars into the campus and Bozeman community.

At the faculty level, OIP assists faculty to remain at the cutting edge of their fields at the global level. OIP provides information and assistance to members of the faculty wishing to engage in international research, participate in a faculty exchange program, or develop international dimensions to their courses. In addition, OIP assists departments and offices in obtaining visas and making other arrangements necessary to host visiting scholars from abroad.

OIP is also responsible for developing and maintaining international institutional relationships between MSU and selected universities throughout the world. At present, MSU maintains active relationships with 27 universities in 14 countries, and more sister institution relationships are under development. OIP reports to the Office of the Provost and works closely with the MSU International Programs Committee in conducting its programs.

Study Abroad

MSU encourages students to study abroad, both to build the international skills which are increasingly needed in all professions and for the intrinsic educational value of studying outside one's home country.

In addition to programs offered by the Office of International Programs, numerous special programs are developed by MSU faculty members which allow groups of MSU-Bozeman students to travel and study abroad. Students earn full credit while participating in MSU-sponsored study abroad programs, and in most cases can maintain regular progress toward their MSU-Bozeman degree while studying abroad. An MSU-approved study abroad experience also satisfies the University Core Curriculum Multicultural/Global requirement.

Fees for most study abroad programs are based on MSU-Bozeman tuition rates, enabling students to study abroad for little additional cost over remaining
on the Bozeman campus. In addition, students eligible for financial assistance may apply their aid package to meet study abroad costs.

OIP’s International Opportunities Resource Center, located on the fourth floor of Culbertson Hall, offers students professional study abroad advising services and extensive reference materials on MSU-sponsored and non-MSU-sponsored study abroad programs.

International Students

MSU encourages qualified students from other nations to enroll in its programs on a degree-seeking, non-degree, or exchange basis. International students enrich the MSU campus, exposing MSU students to the diverse cultures and traditions of other nations. In order to enable international students to succeed at MSU-Bozeman and to have a positive experience on the campus, the Office of International Programs, located on the fourth floor of Culbertson Hall, offers a program of outreach, cultural and academic orientation, and instruction in English as a Second Language through the ACE Language Institute.

International Institutional Partners

MSU-Bozeman maintains sister-institutional relationships with many internationally selected universities around the world. With these institutions, MSU offers student and faculty exchanges, conducts collaborative research activities, and other cooperative programs. Current sister institutions abroad include:

- **Australia**
  - Flinders University, Adelaide
  - University of Western Sydney, Hawkesbury
  - University of Wollongong, Wollongong
  - Macquarie University, Sydney
- **France**
  - Paul Valery University (Montpellier III)
  - Eberhard-Karls-Universitat, Tubingen
  - Martin-Luther-Universitat, Halle
  - Technische Universitat, Berlin
- **United Kingdom**
  - University College, Galway
- **Japan**
  - Asia University, Tokyo
  - Kansai Gaidai University, Osaka
  - Kumamoto University, Kumamoto
  - Prefectural University of Kumamoto
  - Kumamoto Gakuen University
- **Mexico**
  - Universidad Autonoma de Baja California
  - Mexico

Additional international partnerships are under development to meet the growing need for international educational opportunities for MSU students and faculty. These relationships are maintained by the Office of International Programs, Culbertson Hall, fourth floor.

The Spectral Information Technologies Laboratory

The Spectrum Lab charter comprises three missions: developing multi-spectral optical concepts into prototype systems that provide computational, communication, sensor or measurement capabilities that exceed state-of-the-art capabilities; providing an educational environment for graduate and undergraduate students that prepares them directly for the goal-oriented, time-critical, team project emphasis of corporate research; and establishing corporate partnerships to transition emerging applications to commercial products, boosting economic growth and infrastructure in Montana. To accomplish these goals, multidisciplinary teams from diverse technical areas assemble to pursue specific development projects. Optical and electronic laboratory facilities support research efforts complemented by departmental research programs, drawing on the combined expertise of Spectrum Lab personnel and affiliated faculty. A 32-processor SGI Origin 2000 supercomputer, shared with the CCB, provides superb scientific modeling capability.

Several projects are ongoing. An all-optical correlator project will process signals continuously at 10 Gbit/sec. One application consists of identifying patterns in multiple-probe data from neural bundles to establish their adaptive cooperative function. More generally, this correlator can contribute to iterative computation, used in adaptive imaging. Cache memory for a next-generation (petaflops-scale) supercomputer will be built using all-optical technology. Application of this concept extends to buffer memory for data routing in communication networks. Supplementing this capability, all-optical routing switches are being devised with intended application in storage area networks—large distributed data banks, regionally interconnected. Frequency references for spectroscopic measurement and clocks have been demonstrated in compact implementations, and their application in precision-timing measurement instruments is under development.

The common thread throughout these projects is the exploitation of the spectral attributes of optical fields to provide either immense bandwidth in information processing or exquisite precision in oscillator stability. A spectroscopic discipline called spectral hole burning (or optical coherent transients) sustains much of the technology development. Other core techniques include ultra-short optical pulse shaping for data multiplexing, and the development of optical micro-resonators for wavelength discrimination and switching devices.

The Spectrum Lab staff consists of research scientists and engineers as well as postdoctoral fellows. It currently recognizes faculty affiliates in Physics, Electrical and Computer Engineering, and Chemistry and Biochemistry. Collaborations with Computer Science and Mathematical Sciences are anticipated. The Spectrum Lab has close connections with other MSU centers: the Optical Technology Center (OpTeC), the Center for Computational Biology (CBE) and the Center for Biofilms Engineering (CBE).

Both graduate and undergraduate students are supported to participate in Spectrum Lab projects. Research that contributes to these projects, pursued under the supervision of either Spectrum Lab research professor staff or affiliated departmental faculty, can partially satisfy educational requirements or serve as the independent work toward advanced degrees.

For more information, go to http://www.spectrum.montana.edu/ or call (406)-994-6869.