MARK L. BIERMANN

HOME ADDRESS: [redacted]

OFFICE ADDRESS: [redacted]

EDUCATION

Ph.D. in Optics, University of Rochester, Rochester, NY, February 1992
Thesis directed by Carlos Stroud, Jr.; Title: *Wave Packets in a Semiconductor Superlattice: A Theoretical Study of Coherent Dynamics in a Solid State System*
M.S. in Optics, University of Rochester, 1989
B.S. in Optics, University of Rochester, 1984, earned "with the Highest Distinction"

EXPERIENCE

July 2014 – Present, Valparaiso University, Valparaiso, IN

Provost and Executive Vice President for Academic Affairs
Professor of Physics and Astronomy, tenured

Serve on the President's Council as the Chief Academic Officer of the University. Act in the President's stead as needed. Responsible for all areas related to academic programs, student affairs, the library, international programs, innovation, retention and student success, diversity and inclusion, and campus ministries. Oversee the colleges of the university, including Arts and Sciences, Nursing and Health Professions, Engineering, Business, and Christ College, the honors college of the university, Graduate School and Continuing Education, and the School of Law. Responsible for Campus Ministries through the Assistant Vice President for Ministry and Mission, the Registrar's Office through the Associate Provost, the Christopher Center for the Library and Information Resources through the Dean of Library Services, and for Student Affairs through the Vice President for Student Affairs.

Significant Service and Administrative Activities
*Member of the Strategic Planning Committee.
*Member of the President's Cabinet.
*Convene and preside at Provost's Council and Deans' Council.
*Served on the Steering Committee for the design and construction of the Center for the Sciences, Chemistry and Biochemistry building project, July 2014-October 2017.
*Created the position and hired the first Assistant Provost for Diversity and Inclusion at Valparaiso University.
*Provided program and planning support to, and am directly involved with, the $250 million capital campaign.
*Met with potential and current donors in coordination with the Office of Advancement.

*Oversaw the planning and execution of the highly successful 10-year re-affirmation of accreditation process, including preparation and the campus visit by a peer-review team.
*University staff liaison for the Academic and Student Affairs Committee of the Board of Directors.
*Provided leadership to the development and implementation of new academic programs, including: Data Science, Aviation, Bioengineering, Environmental Engineering, Music Therapy, Occupational Therapy, and Supply Chain Management/Logistics. Developing additional new programs, including an online Information Technology graduate program, and Engineering Business.
*Oversaw the successful hire of three University Endowed Chairs, the Duesenberg Chair in Christian Ethics, the Eckrich Chair in Christianity and the Healing Arts, and the Jochum Chair in Christianity in Public Life.
*Identified and hired a dean for the College of Nursing and Health Professions.
*Identified and hired a dean for Christ College, the Honors College.
*Identified and hired a dean for the Christopher Center Library.
*Led a review of the academic plan for the University, with the work flowing into the University Strategic Planning Process. A new Strategic Plan was adopted by the Board of Directors in 2017.
*Accomplished budget reductions of over $9.0 million over the past four years.
*Hosted a national convening of the New American Colleges and University at the Summer Meeting, 2017.
*Led the Valparaiso effort to successfully create a reverse transfer agreement with the IVY Tech Community College System.
*Helped to oversee the implementation of the new workload model for faculty across the University.
*Started a student retention initiative, leading to the hiring of a new Executive Director for Student Retention and Success.
*Initiated a campus-wide discussion of the academic calendar. An alternative model for a new academic calendar has been approved and will be implemented in 2020-2021.
*Helped to establish a speakers' series focused on having difficult discussions, and have addressed issues such as same-sex marriage, and women's reproductive rights.
*Supporting efforts to address the significant downturn in international enrollments.
*Established the first-ever building access policy for academic buildings at the University, supporting student, guest, and employee safety.

June 2012 – May 2014, Wartburg College, Waverly, IA

Vice President for Academic Affairs and Dean of the Faculty
Professor of Physics

Served on the President's Cabinet as the Chief Academic Officer of the College. Responsible for accreditation, academic assessment, the library, all functions related to academics, personnel issues related to all faculty (approximately 110 full-time) and academic staff, faculty development, strategic planning, and other responsibilities.

Significant Service and Administrative Activities

*Ex-Officio member of the Appointment, Rank, and Tenure Committee, the Faculty Council, the Faculty Development Committee, the Educational Policies Committee, and the General Education Committee.
*Member of the President's Cabinet, the senior leadership team for the college, the Mission Effectiveness Committee, the Admissions and Scholarship Committee, and various special committees and task forces.
*Co-chair of the Student Development Plan Task Force.
*Member of the Planning group for a German Institute at Wartburg College.
*Coordinated new program development, including a post-baccalaureate leadership certificate, and a public health major.
*Led development and implementation of cooperative programs with Deutsche Welle Academy and Bonn-Rhein-Sieg University of Applied Sciences, Bonn, Germany.
*Oversaw re-alignment of reporting lines for the Registrar's Office, which moved into the academic affairs area.
*Led the successful application of Wartburg College to the Academy for the Assessment of Student Learning, Higher Learning Commission.
*Created a Director of Assessment Position, a Music Tours Coordinator, and a College Sponsored Programs position.
*Supervised a new Pre-Law Coordinator position and programs.
*Provided guidance to the re-launch of the Scholars Program, the Wartburg College Honors program.
*Led the academic affairs effort to reallocate funds within the college budget, including making cuts in the academic affairs area.
*Coordinated the development of a comprehensive educational technology plan for Wartburg College.
*Supported the reaccreditation process for our Social Work Program.
*Facilitated a reorganization of the librarians and library staff.
*Led a group that explored an early childhood development program.
*Supported the Advancement Office in a focused technology initiative.
*Member of a group that reviewed and implemented a new travel insurance program for our study-abroad students and faculty.
*Involved in campus master planning activities.
*Worked with the relevant faculty committee to review the sabbatical program with the goal of improving the quality of sabbaticals.

June 2008 – May 2012, Taylor University, Upland, IN

Inaugural Dean, School of Natural and Applied Sciences
Professor of Physics
Responsible for oversight of the School of Natural and Applied Sciences, including six academic departments and two independent centers. Responsible for administering the financial, personnel, assessment, long-term planning, facilities, scheduling, organizational, and curricular areas of the School. Taught one course per year and performed service to the university and community.

Significant Service and Administrative Activities:
*Chair of New Science Building Work Group, July 2008 – May 2012. I had primary responsibility for the program aspects of the new Science Learning Center and fulfilled the role of building shepherd for the new Science Learning Center, having acted as the contact for all faculty, student, and staff input about the building project. Building construction initiated June 2010 and completed in May 2012.
*Member of the Strategic Initiatives Review, or SIRv, a group of 12 senior administrators that worked directly with the University President on strategic initiatives, September 2011- May 2012.
*Member of the university Teacher Education Committee, August 2008 – June 2009.
*Member of the university Community Life Committee, August 2010 – May 2011.
*Member of the University Assessment Council, August 2008 – May 2012
*Member of the Provost's Council, August 2008 – May 2012.
*Member of the University Deans' Council, June 2008 – May 2012.
*Member of the University Planning Council, June 2008 – May 2012.
*Member of the ABET Oversight Committee for ABET accredited engineering programs, June 2008 – May 2012.
*Member of the School of Natural and Applied Sciences Curriculum Management Committee, June 2009 – May 2012.
*Member of the Online Mediated Instructional Taskforce, 2008 - 2009.
*Member of the TUOnline Review Taskforce, December 2010 – May 2012.
*Member of the General Education Revision Taskforce, January 2011 – May 2012.
*Member of the University Financial Sustainability Taskforce, April 2010 – September 2010.
*Instituted and organized a Scholars' Lunch program in which faculty of the School of Natural and Applied Sciences gathered monthly for lunch to learn about the scholarship of colleagues.
*Facilitated the renaming of the School of Natural Sciences to the School of Natural and Applied Sciences.
*Initiated the Distinguished Faculty Lecture, to recognize outstanding scholarship, and the Teaching Excellence Award in the School of Natural and Applied Sciences.
*Initiated the School of Natural and Applied Sciences Newsletter.

July 2004 – May 2008, Eastern Kentucky University, Richmond, KY

July 2007 – May 2008, Professor of Physics and Chair, Department of Physics and Astronomy, tenured
July 2004 – June 2007, Associate Professor of Physics and Chair, Department of Physics and Astronomy, tenured
Responsible for administering the Department of Physics and Astronomy, including financial, personnel, assessment, long-term planning, facilities, scheduling, organizational and curricular areas. Taught a variety of courses and performed service to the university and community. Continued an active program of research involving undergraduate students.

Significant Service and Administrative Activities:
*Chair of the EKU Chairs Association, 2007-2008. The Chairs Association was the organization for the chairs of the academic programs and departments across the university, with approximately 35 members. The position was filled by election by the members of the association.
*Chair-elect of the EKU Chairs Association, 2006-2007.
*Member of the Search Committee for the Dean of the College of Arts and Sciences, 2007. Appointed by the Provost.
*Member of the Provost's Council, 2007-2008. This body was the senior administrative group for academic affairs at the university.
*Project Partner with the Director of Women's Studies for the Recruitment and Retention of Women in Science Project, 2006-2008.
*Member of the Search Committee for the Chair of the Department of English and Theatre, 2006-2007. Appointed as the outside member by the Dean of the College of Arts and Sciences. Search was successful after a failed search the previous year.
*Member of the Planning Committee for the New Science Building, 2005-2008.
*Member of New Science Building Planning Group, 2004-2005.
*Member of the College Curriculum Committee, 2004 -2007.
*Member of College Safety Committee, 2004-2006.
*Member of the University Intellectual Property Committee, 2004-2008.
*Member of the University General Education Committee, 2005-2008.
*Wrote the Department of Physics and Astronomy Hiring Procedure, September 2004.
*Wrote the Department of Physics and Astronomy Promotion and Tenure Guidelines, 2004-2006. Coordinated with the members of the department in revising and enhancing the guidelines. The guidelines, with criteria, were adopted in the spring of 2006.
*Wrote the departmental Institutional Effectiveness Annual Report, 2004, 2005, 2006, 2007.
*Wrote the first departmental strategic plan, 2004. Plan was in effect from 2004-2005. Obtained feedback and assistance from department members in achieving final form of the plan. This plan and successive plans represented the first comprehensive assessment plan for departmental programs.
*Wrote the departmental strategic plan for the 2006-2010 planning cycle, 2006. Obtained feedback and assistance from department members in achieving final form of the plan.
*Revised the departmental mission statement, Fall 2004. Worked with members of the department to revise the statement.
*Wrote the vision statement for the department for planning related to the new science building, 2004.
*Writing the Program Review Report for the Physics/Teaching, B. S. program, Fall 2007.
*Wrote the Program Review Report for the Physics, B. S. program, Fall 2005.
*Wrote the Program Review Report for the Science for Engineering A. S. program, Fall 2005.
*Composed departmental response to Council on Postsecondary Education directive concerning potential program elimination and alteration, November 2004.
*Prepared a position description for the Coordinator of Laboratory Equipment position, 2005.

*Chair of the Search Committee for two tenure-track faculty members; both positions were filled with the first women ever hired in the department in tenured or tenure-track faculty positions.
*Member of the Council on Postsecondary Education Committee for the Engineering Pipeline in Kentucky, Spring 2005-2007. This group was a state-wide committee and I was one of two EKU representatives on this committee.

June 2000 – June 2004, United States Naval Academy, Annapolis, MD

August 2003 – June 2004, Associate Professor of Physics, Physics Department, tenured
June 2000 – August 2003, Assistant Professor of Physics
Responsible for teaching both advanced undergraduate courses in physics and general education courses in physics. Conducted research in cooperation with a group at the Naval Research Laboratory, Washington, DC and a group at the Max Born Institute, Berlin, Germany. Served on committees at various levels at the Naval Academy. Served as an academic advisor.

Significant Service and Administrative Activities:
*Coordinated the move of an advanced teaching laboratory into a temporary space during an extensive renovation of existing spaces, 2003.
*Coordinator of the Departmental Senior Capstone Writing Assignment, 2002-2004. Redesigned the entire assignment to include a wider contribution from a variety of faculty in guiding and assessing student work, working toward a full mentoring model.
*Plebe, First-Year, Academic Advisor, 2002-2004. Plebe academic advisors undergo special training and are involved in many aspects of the first-year experience for students at the USNA.
*Introduced a Physics in Context experience in a senior physics course. Students explored the efforts of German scientists to develop an atomic weapon during WW II and completed oral and written reports concerning the intent of the scientists and the role of ethics in scientific research, 2001, 2002.
*Developed a proposal for a Photonics Track within the Physics major program, 2001-2003.
*Departmental representative to Academy-wide Assessment Planning and Implementation Meetings and related activities along with the department chair, 2001-2004. Helped the department to develop an assessment plan.
*Facilitator at the Senior Capstone Character Development Series for the USNA, 2002-2003.
*Co-Founder of the Photonics and Information Sciences Center at the USNA, 2001-2004. Organized the colloquium series for the center and helped to develop funding proposals for the center.
*Member of the USNA Faculty Senate, 2002-2004. One of three senators elected from the 33-person department. Re-elected in 2003.
*USNA liaison to the Council on Undergraduate Research, 2001-2004.
*Member of Carnegie Foundation Group on the Scholarship of Teaching and Learning, including sponsoring of guest speakers, 2000-2001.

*Member of Departmental Curriculum Review Committee for the Physics of the Atom Sequence, 2000-2003.
*Member of the Space Committee for the Building Renovation for the Physics Department, 2000-2004. Involved in the design and development of an advanced physics teaching laboratory.

September 1998 – May 2000, Houghton College, Houghton, NY

September 1999 – May 2000, Associate Professor of Physics, Director of Physics and Earth Science Programs, Department of Physics and Earth Science
September 1998 – August 1999, Assistant Professor of Physics
Responsible for teaching both advanced undergraduate courses in physics and general education courses in physics and earth science. Directed the 3-2 engineering program at Houghton College. Conducted research involving undergraduates. Served on college and departmental committees. Served as an academic advisor. Carried out various departmental administrative duties including oversight of curriculum development, budget, course scheduling, student recruiting, and interdepartmental coordination.

Significant Service and Administrative Activities:
*Director of Physics and Earth Science Programs, 1999-2000. Responsible for curriculum development, scheduling, faculty evaluations, budgeting and expenditures, program development.
*College Curriculum Review Committee, 1999-2000.
*College Enrollment Management Council, 1999-2000.
*Carnegie Teaching Academy, 1998-2000.
*Co-Chair First-Year Science and Technology Honors Program Task Force, 1999-2000.
*Created the first service learning course in the Department of Physics and Earth Science.
*Established a Dual-Degree Engineering program with Washington University, St. Louis, MO, 1999.

September 1995-May 1998, Buena Vista University, Storm Lake, IA

Assistant Professor of Physics, Physics Program, School of Science
Responsible for teaching both advanced undergraduate courses in physics and general education and introductory courses in physics, math, and astronomy. Acted as Freshman Seminar Director and Freshman Advisor. Conducted research involving undergraduates. Served on university committees. Conducted extensive community outreach.

Significant Service and Administrative Activities:
*Chair of the BVU Alcohol and Drug Policy Review Task Force, 1997-1998. We successfully completed the first significant revision of the statement in a number of years.
*Member of the BVU Freshman Year Experience and Advising Task Force. The task force was appointed by the President, and we spent the year reviewing the Freshman

Year Experience and Advising with special emphasis on assessment and programming, 1997-1998.
*Created, organized and oversaw the Storm Lake Microclimate Research Project in conjunction with BVU students and 5 area K-12 teachers and their students. Approximately 10 BVU students and 140 K-12 students were involved.
*Reviewed grant proposals submitted to the Iowa Science Foundation, 1997.
*Appointed and served as a member of the Recognition and Awards Committee of the Iowa Academy of Science, 1997-1998.
*Member of the Student Services Committee of the Faculty Senate, 1996-1998.
*Member of the BVU Mission and Mission Statement Committee, 1996-1997.
*Faculty advisor for the Buena Vista University Science Club, 1996-1997.
*Organized an advanced Amusement Park Physics program, May 1997.
*Co-Organized a Girl Scout Badge Day Event for area Girl Scout Troops. 1996, 1997.
*Member of a theme-level program committee for ACES events, 1995-1996. ACES events were university-wide special events designed for students and community members.

September 1992–May 1995, Whitworth College, Spokane, WA

Assistant Professor of Physics and Pre-engineering Coordinator, Physics Department
Visiting Professor in the Lindaman Chair of Communication, Technology and Change
Responsible for teaching both advanced undergraduate courses in physics and chemistry, and general education courses in physics and astronomy. Directed the 3-2 engineering program at Whitworth College. Research involving undergraduates was developed. Service on college and departmental committees was carried out. Served as a freshman advisor.

Significant Service and Administrative Activities:
*Member search committee, Mathematics Department, Whitworth College, 1995.
*Member search committee, Lindaman Chair of Science, Technology and Change, 1995.
*Member search committee, Chemistry Department, Whitworth College, 1994.
*Initiated and completed new Dual-Degree Engineering Program with Seattle Pacific University, 1995.
*Member of the Spokane Economic Development Council, High Technology Committee, 1992-1994.
*Member of the Manufacturing Design Curriculum Advisory Committee, University High School, Central Valley School District, Spokane County, WA, 1992-1995.
*Member of Science and Technology Curriculum Review Committee for Central Valley High School, Central Valley School District, Spokane County, WA, 1992-1993.
*Member of Program Committee for the Initiatives in Technology Series of the Spokane Intercollegiate Research and Technology Institute (SIRTI, www.sirti.org), Spokane, WA, 1992-1994. Helped to organize the first conference on the internet for businesses and other constituencies in Spokane.
*Member of the Intellectual Property Protection Committee of the Spokane Intercollegiate Research and Technology Institute, Spokane, WA, 1994-1995.

*Member of Evaluation Committee to consider funding of proposals to the Spokane Intercollegiate Research and Technology Institute, Spokane, WA, 1994-1995.
*Member of Manufacturing Technology Center Task Force for the Advisory Council of the Spokane Intercollegiate Research and Technology Institute, 1993-1994.
*Board Member of the Washington State Science Olympiad and Co-Director of the 1995 Eastern Regional Washington State Science Olympiad Tournament, 1994-1995. Organized and oversaw the first regional science Olympiad held at Whitworth College, involving over 300 students and 40 volunteers. Worked with local corporations to obtain donations and support.
*Appeared as a science resource on local radio KXLY, AM 920.
*Hosted representatives from Jilin Teachers College, Jilin, China.
*Director of Arbitration at the Washington State Science Olympiad, Cheney, Washington, 1998.
*Coordinated Science Program for 600 students at Sunrise Elementary School, Spokane Valley School District, 1995.

August 1991 - May 1992, Saint John Fisher College, Rochester, NY

Adjunct Assistant Professor of Physics, Physics Department
Responsible for two courses each semester. One course each semester was a year-long General Physics course for non-majors. Other courses were Statics and the Strength of Materials for physics majors.

November 1991-December 1991, University of Rochester, Rochester, NY

Postdoctoral Research Position, Dr. Carlos Stroud, Supervisor
Conducted theoretical research with a research group.

May 1984-October 1991, University of Rochester, Rochester, NY

Optics Department, Dr. Carlos Stroud, Advisor
Member of research group, concentrating on theoretical studies in Quantum Optics. Specific work included studies of quantum/classical correspondences in hydrogenic systems and the study of coherent optical and electronic processes in semiconductor systems, particularly in quantum wells and multiple quantum wells. Thesis work was in coherent and cooperative effects in optically excited semiconductors.

January - December 1984, University of Rochester, Rochester, NY

Optics Department
Teaching assistant for graduate level courses. Conducted review sessions and supplementary lectures, prepared solution sets, graded problem sets.

May-August 1983 and 1984, Eastman Kodak Company, Rochester, NY

Worked in a Summer Internship Program as an Engineer in the Optical Engineering Department and Optical Development Group. Work included computer program development for modeling optical systems and designing and building optical testing devices.

Sept. 1982-May 1983, University of Rochester, Rochester, NY

Math Department
Worked as a Teaching Assistant. Conducted a review session for about 20 students, graded assignments and wrote and gave weekly quizzes.

PEER-REVIEWED PUBLICATIONS
(* indicates undergraduate co-author)

"When Two Balls Are Just One," Christopher W. Kulp, Mark L. Biermann, Timothy Howard*, and Kurtis Klingenberg*, The Physics Teacher, **46**, March, 168-170, (2008).

"Processing-induced strains at solder interfaces in extended semiconductor structures," Mark L. Biermann, Daniel T. Cassidy, Tran Quoc Tien and Jens W. Tomm, The Journal of Applied Physics, **101**, #11, 114512, (2007).

"Strain Relaxation and Defect Creation in Diode Laser Bars," Jens W. Tomm, Tran Quoc Tien, Myriam Oudart, Julien Nagle, and Mark L. Biermann, Materials Science in Semiconductor Processing, **9**, #1-3, 215-219, (2006).

"Strain Relaxation, Band Structure Deformation, and Optical Absorption in Micromachined Semiconductor Heterostructures," T. H. Stievater, W. S. Rabinovich, D. Park, Peter G. Goetz, J. B. Boos, D. S. Katzer, M. L. Biermann, and S. Kanakaraju, Journal of Applied Physics, **97**, #11, 114326, (2005).

"Piezoelectricity in (100) III-V Semiconductors," T. H. Stievater, W. S. Rabinovich, D. Park, J. B. Boos, M. L. Biermann, S. Kanakaraju, and L. C. Calhoun, *CLEO/IQEC and PhAST Technical Digest* on CD-ROM (The Optical Society of America, Washington, DC, 2005).

"Using Local Band Structure to Image Strain in Semiconductor Microstructures," T. H. Stievater, W. S. Rabinovich, D. Park, Peter G. Goetz, J. B. Boos, D. S. Katzer, and M. L. Biermann, Applied Physics Letters, **86,** 111915, (2005).
Reprinted in the Virtual Journal of Nanoscale Science and Technology, **11**, #11, March 21, 2005.

"Relaxation of Packaging-Induced Strains in AlGaAs-Based High-Power Diode Laser Arrays," Tran Quoc Tien, Axel Gerhardt, Sandy Schwirzke-Schaaf, Jens W. Tomm, Jens Biesenbach, Holger Muntz, Myriam Oudart, Julien Nagle and Mark L. Biermann, Applied Physics Letters, **86**, 101911, (2005).

"Spectroscopic analysis of external stresses in semiconductor quantum-well materials," Jens W. Tomm, Mark L. Biermann, M. O. Manasreh, B. S. Passmore, A. Gerhardt, and Tran Q. Tien, Materials Research Society Symposium Proceedings Series, **829**, (2004).

"Spectroscopic method of strain analysis in semiconductor, quantum-well devices," Mark L. Biermann, Steven Duran*, Kelsey Peterson*, Axel Gerhardt, Jens W. Tomm, Artem Bercha and Witold Trzeciakowski, Journal of Applied Physics **96**, 4056-4065, (2004).

"Quantitative Spectroscopic Strain Analysis of AlGaAs-Based High-Power Diode Laser Devices," J. W. Tomm, A. Gerhardt, Mark L. Biermann, J. P. Holland*, Eur. Phys. J. Appl. Phys. **27**, 461-464, (2004).

"Device deformation during low-frequency pulsed operation of high-power diode bars," Axel Gerhardt, Fritz Weik, Tien QuocTran, Jens W. Tomm, Thomas Elsaesser, Jens Biesenbach, Holger Müntz, and Gabriele Seibold, Mark L. Biermann, Martin Behriger and Johann Luft, Applied Physics Letters **84**, 3525-3527, (2004).

"Laterally Patterned Band Structure in Micromachined InGaAs," T. H. Stievater, W. S. Rabinovich, D. Park, P. G. Goetz, J. B. Boos, D. S. Katzer, and M. L. Biermann, *CLEO/IQEC and PhAST Technical Digest* on CD-ROM (The Optical Society of America, Washington, DC, 2004), CTUF5.

"Dependence on intrinsic strain of packaging-induced strain in quantum-well laser diodes," Mark L. Biermann, Steven Duran*, Jens W. Tomm, Axel Gerhardt, and Dirk Lorenzen, *CLEO/IQEC and PhAST Technical Digest* on CD-ROM (The Optical Society of America, Washington, DC, 2004), CTuP3.

"Laterally Patterned Bandstructure in Micromachined Semiconductors," T. H. Stievater, W. S. Rabinovich, J. B. Boos, D. S. Katzer, and Mark L. Biermann, Applied Physics Letters **83**, 4933-4935, (2003).

"Characterization of Optical Anisotropy in Quantum Wells Under Compressive, Anisotropic In-Plane Strain," Mark L. Biermann, Matthew Walters*, James Diaz-Barriga* and W. S. Rabinovich, Journal of Physics D: Applied Physics **36**, 2446-2450, (2003).

"Cat's Eye Quantum Well Modulating Retroreflectors for Free-Space Optical Communications," William S. Rabinovich, Peter G. Goetz, Rita Mahon, Eugene Waluschka, K. S. Katzer, Steven C. Binari, Mark L. Biermann and G. C. Gilbreath, Free-

Space Laser Communication Technologies, XV, Proceedings of SPIE -- Vol. 4975, G. Stephen Mecherle, Editor, p. 92-102, (July 2003).

"Laterally Patterned Bandstructure and Surface-Normal Anisotropy in Micromachined (001) InGaAs Multiple Quantum Wells," T. H. Stievater, W. S. Rabinovich, J. B. Boos, D. S. Katzer, and Mark L. Biermann, Integrated Photonics Research Topical Meeting, 2003, Technical Digest Series, (Optical Society of America, Washington, DC 2003).

"An Optical Method for Determining Strain Anisotropy in Quantum Wells," Mark L. Biermann, James Diaz-Barriga*, and W. S. Rabinovich, Applied Optics **42**, 3558-3563, (2003).

"Quantitative Strain Analysis in AlGaAs-Based Devices," Jens W. Tomm, Axel Gerhardt, Roland Muller, Mark L. Biermann and Joseph P. Holland*, Dirk Lorenzen, Eberhard Kaulfersch, Applied Physics Letters **82**, 4193-4195, (2003).

"Modeling of Packaging-Induced Strains in Quantum-Well Laser Diodes," Mark L. Biermann, Joseph P. Holland*, Jens W. Tomm, Axel Gerhardt, and Dirk Lorenzen, *Trends in Optics and Photonics (TOPS)* **59**, *Conference on Lasers and Electro-Optics (CLEO 2003)*, Technical Digest, (Optical Society of America, Washington, DC, 2003).

"Enhanced Optical Polarization Anisotropy in Quantum Wells Under Anisotropic Tensile Strain," Mark L. Biermann, James Diaz-Barriga*, and W. S. Rabinovich, IEEE J. of Quantum Electron. **39**, 401-403, (2003).

"Double Polarization Anisotropy in Asymmetric, Coupled Quantum Wells Under Anisotropic, In-Plane Strain," Mark L. Biermann and W. S. Rabinovich, Opt. Express **10**, 1105-1110 (2002).

"Wien's Law and The Temperature of the Sun," Mark L. Biermann, Debora Katz, Robert Aho*, James Diaz-Barriga* and Jerome Petron*, The Physics Teacher, **40**, 398, (2002).

"Design and Analysis of a Diffraction Limited Cat's-Eye Retroreflector," Mark L. Biermann, W. S. Rabinovich, Rita Mahon and G. C. Gilbreath, Optical Engineering, **41**, 1655, (2002).

"Valence Subbands in $Ga_{1-x}In_xAs/Ga_{1-y}Al_yAs$ Quantum Wells Under In-Plane Biaxial and Uniaxial Strain," Mark L. Biermann and W. S. Rabinovich, *Trends in Optics and Photonics (TOPS)* **58**, *Quantum Electronics and Laser Science Conference (QELS 2002)*, Technical Digest, (Optical Society of America, Washington, DC, 2002), 208.

"Using the GPS to Determine the Size of Earth," Mark L. Biermann and Nicholas A. Nelson*, The Physics Teacher, **38**, 360, (2000).

"Accuracy of Global Positioning System Receivers," Lois A. A. Biermann, Rebecca J. Daws*, Helen A. Schumacher*, and Mark L. Biermann, The Physics Teacher, **36**, 158 (1998).

"Image Quality and Simplicity in Basic Holography," Mark L. Biermann and Brent L. Hild*, The Physics Teacher, **35**, 408 (1997).

"When the *f*/# is Not the *f*/#," Mark L. Biermann and Lois A. A. Biermann, The Physics Teacher, **34**, 312 (1996).

"A Wave Packet Theory of Coherent Carrier Dynamics in a Semiconductor Superlattice," Mark L. Biermann and C.R. Stroud, Jr., Physical Review B, **47**, 3718 (1993).

"Wave Packets in a Semiconductor Superlattice," Mark L. Biermann and C.R. Stroud, Jr., Appl. Phys. Lett. **58**, 2279 (1991).

"Wave Packets in a Semiconductor Superlattice," Mark L. Biermann and C.R. Stroud, Jr., Integrated Photonics Research, 1991, Technical Digest Series, (Optical Society of America, Washington, DC 1991), 110.

"Behavior of Zone-Center, Subband Energies in Narrow, Strongly Coupled Quantum Wells," Mark L. Biermann and C. R. Stroud, Jr., Appl. Phys. Lett. **58**, 505 (1991).

BOOK CHAPTERS CONTRIBUTED

"Teaching, Research, Service, and Your Life: A Balancing Act," chapter contributed to the book *How to Get Started in STEM Research with Undergraduates* from the Council on Undergraduate Research, Merle Schuh, editor, published April 2013.

"A Research Course Designed for First Year Students: A Retention, Recruiting and Learning Tool Using Undergraduate Research," chapter contributed to the book *Broadening Participation in Undergraduate Research: Fostering Excellence and Enhancing the Impact* from the Council on Undergraduate Research, Jodi L. Weseman and Mary Boyd, editors; published May 2009.

"Quantum-Well Laser Array Packaging." J. W. Tomm, J. Jimenez, eds., book published by McGraw Hill Professional Publishers; contributor to one of the chapters in the book; November 2006.

PUBLICATIONS, NON-PEER-REVIEWED

"How Bad Photographs Can Provide Good Optics Education Opportunities," Mark L. Biermann, OPN: Optics and Photonics News, **12**, #5, 20 (2001).

"A Temperature and Wind Research Project Involving Elementary Through Undergraduate Students," Mark L. Biermann, Colleen Burrichter*, and Helen Schumacher*, Iowa Technical Journal, National Weather Service, **6**, #2 (1998).

"Clarity, Reality, and the Art of Photography," Mark L. Biermann, Quantum, **6**, # 1; 26 (1995).

PRESENTATIONS
(* indicates undergraduate co-presenter/co-author)

"Optics, Your Eye, and Your Camera," presented to VOLTS, the Valparaiso Organization for Learning and Teaching Seniors, February 2018, and to ReVU, the retiree group for Valparaiso University, March 2017.

"Creative Funding Sources for Undergraduate Research: It's Not Just About Grants," by Michael P. Castellani, David Brakke, Marilyn Hart, Robert Rycek, and Mark Biermann, Council on Undergraduate Research 2014 National Meeting, Washington, DC, June 2014.

"Beginning a Research Program in the Natural Sciences at a Predominantly Undergraduate Institution," co-facilitator of a 3-day Council on Undergraduate Research Institute, University of South Alabama, Mobile, AL, November 2012; San Diego, CA, November 2013, Greensboro, NC, November 2014, Denver, CO, November 2015, Arlington, VA November 2016.

"Hiring New Faculty – What do deans and chairs look for?" panel member for a panel for the Preparing Future Faculty Seminar, Iowa State University, September 2012 and 2013.

"Beginning a Research Program in the Natural Sciences at a Predominantly Undergraduate Institution," co-facilitator of a 3-day Council on Undergraduate Research Institute, Calvin College, Grand Rapids, MI, November 2010 and Hope College, Holland, MI, November 2011.

"So, You Are Thinking About the Dark Side: Opportunities and Challenges in Academic Administration," by Mark L. Biermann, Mary K. Boyd, Beth A. Cunningham, and Jeffrey M. Osborn, Council on Undergraduate Research 2010 National Meeting, Weber State University, Ogden, UT, June 2010.

"Beginning a Research Program in the Natural Sciences at a Predominantly Undergraduate Institution," co-facilitator of a 3-day Council on Undergraduate Research Institute, Calvin College, Grand Rapids, MI, June 2010, November 2009, November 2008.

"Getting and Keeping a Tenure-Track Position at a PUI, by Mark L. Biermann, Hank Yokum, Kim Frederick and David Schaefer, Council on Undergraduate Research 2008 National Meeting, College of St. Benedict, St. Joseph, MN, June 2008.

“Beginning a Research Program in the Natural Sciences at a Predominantly Undergraduate Institution,” co-facilitator of a 3-day Council on Undergraduate Research Institute, Davidson College, Davidson, NC, June 2008.

"Using a Digital Camcorder to Analyze the Motion of a Freely Falling Object," Christopher W. Kulp, Mark L. Biermann, Kurtis Klingenberg and Timothy Howard, presented at the Spring Meeting of the Kentucky Association of Physics Teachers, Lexington, KY, March 2007.

"A Microclimate Study of a Temperature-Stabilized Wine Cellar", Garry Snowden*, and Mark L. Biermann, presented at the Spring Meeting of the Kentucky Association of Physics Teachers, Lexington, KY, March 2007.

"Strain in Semiconductor Quantum-Well Devices and Structures: The Good and the Bad," invited colloquium in the Condensed Matter Physics Seminar series at the University of Kentucky, Department of Physics, Lexington, KY, presented January 2007.

"Spectroscopic Method for Determining the Strain Configuration in Semiconductor Optoelectronic Devices and Structures," by Mark L. Biermann, Frontiers in Optics 2006/Laser Science XXII, Rochester, NY, October 2006.

"Undergraduate Research in Theoretical/Computational Physics: Challenges and Rewards, by Sasha Dukan, Mark L. Biermann, Paul Ohmann, Catherine Mader, Council on Undergraduate Research 2006 National Meeting, DePauw University, Greencastle, IN, June 2006.

"Data Loggers Used for Simple Student Research Projects," by Mark L. Biermann, Kyle Young*, Jeremy Hornbeck*, and Denise Carpenter*, presented at the Spring Meeting of the Kentucky Association of Physics Teachers, Lexington, KY, March 2006.

"Seasonal Variations in Temperature-Based Microclimates Near Human Structures," Mark L. Biermann, Kyle Young*, and Jeremy Hornbeck*, Kentucky Academy of Sciences Annual Meeting, Richmond, KY, November 2005.

"Strain Relaxation and Defect Creation in Diode Laser Bars," Jens W. Tomm, Tran Quoc Tien, Myriam Oudart, Julien Nagle, and Mark L. Biermann, 11th International Conference on Defects - Recognition, Imaging and Physics in Semiconductors (DRIP XI), Beijing, China, September 2005.

"Laterally Patterned Quantum-Well Structures," colloquium at the Max Born Institute, Berlin, Germany, presented June 20, 2005.

"Piezoelectricity in (100) III-V Semiconductors," T. H. Stievater, W. S. Rabinovich, D. Park, J. B. Boos, M. L. Biermann, S. Kanakaraju, and L. C. Calhoun, presented at CLEO/QELS 2005, Baltimore, MD, May 2005.

"III-V Semiconductor Quantum Wells: Good Strain, Bad Strain and Their Effects," invited departmental colloquium, Department of Physics and Astronomy, Western Kentucky University, presented March 28, 2005.

"A Research Course for Freshmen?" Mark L. Biermann, presented at the Spring Meeting of the Kentucky Association of Physics Teachers, Lexington, KY, March 2005.

"Exploring 'Afternoon Sun: A Microclimate Study of Localized Solar Heating," Jeremy Hornbeck* and Kyle Young*, mentored by Mark L. Biermann, accepted for presentation at the Posters at the Capital Event, Frankfort, KY, February 2005.

"Spectroscopic analysis of external stresses in GaAs-based optoelectronic devices," Jens W. Tomm and Mark L. Biermann, invited presentation at Coherent, Inc., Santa Clara, CA, January 2005.

"Spectroscopic analysis of external stresses in semiconductor quantum-well materials," Jens W. Tomm, Mark L. Biermann, M. O. Manasreh, B. S. Passmore, A. Gerhardt, and Tran Q. Tien, invited presentation at the MRS Fall meeting, Boston, MA 2004.

"Laterally Patterned Band Structure in Micromachined InGaAs," T. H. Stievater, W. S. Rabinovich, D. Park, P. G. Goetz, J. B. Boos, D. S. Katzer, and M. L. Biermann, presented at Quantum Electronics and Laser Science, San Francisco, CA, May 2004.

"Dependence on intrinsic strain of packaging-induced strain in quantum-well laser diodes," Mark L. Biermann, Steven Duran*, Jens W. Tomm, Axel Gerhardt, and Dirk Lorenzen, presented at Conference on Lasers and Electro-Optics, San Francisco, CA, May 2004.

"Computer Analysis of Strained Quantum Wells in High-Power Diode Lasers," Kelsey Peterson* (Mark L. Biermann, mentor), presented at the Undergraduate Research Poster Session on Capitol Hill 2004, Washington, DC, April 2004.

"Quantitative Spectroscopic Strain Analysis of AlGaAs-Based High-Power Diode Laser Devices," J. W. Tomm, A. Gerhardt, Mark L. Biermann, J. P. Holland*, 10th International Conference on Defects - Recognition, Imaging and Physics in Semiconductors (DRIP X), Batz-Sur-Mer, France, September 2003.

"Laterally Patterned Bandstructure and Surface-Normal Anisotropy in Micromachined (001) InGaAs Multiple Quantum Wells," T. H. Stievater, W. S. Rabinovich, J. B. Boos, D. S. Katzer, and Mark L. Biermann, Integrated Photonics Research Topical Meeting, 2003, Washington, DC, June 2003.

"Modeling of Packaging-Induced Strains in Quantum-Well Laser Diodes," Mark L. Biermann, Joseph P. Holland*, Jens W. Tomm, Axel Gerhardt, and Dirk Lorenzen, Conference on Lasers and Electro-Optics, CLEO 2003, Baltimore, MD, May 2003.

"Computer Modeling of Strained Quantum Wells Used in Opto-Electronic Devices," Joseph P. Holland* and Stephen Duran* (Mark L. Biermann, mentor), Undergraduate Research Poster Session on Capitol Hill 2003, Washington, DC, April 2003.

"Using Applied Stress to Model Strain in Quantum-Well Lasers," invited colloquium, Max Born Institute for Nonlinear Optics and Short-Pulse Spectroscopy, Berlin, Germany, presented December 16, 2002.

"Strain and Optical Polarization Anisotropies in III-V Quantum Wells," invited departmental colloquium, Department of Physics, University of Maryland, Baltimore County, presented October 23, 2002.

"Strain and Optical Polarization Anisotropies in III-V Quantum Wells," invited departmental colloquium, Department of Physics and Astronomy, Florida Institute of Technology, Melbourne, FL, presented October 2, 2002.

"Nonlinear Behavior of Subbands in Quantum Wells Under Tensile, Uniaxial, In-Plane Strain," Mark L. Biermann, James Diaz-Barriga* and W. S. Rabinovich, Annual Meeting of the Optical Society of America and Laser Science Conference XVIII, Orlando, FL, October, 2002.

"Getting a Tenure-Track Position at a Primarily Undergraduate Institution," Mark L. Biermann, Session Organizer, presenting with Karen Kolehmainen, Kevin Riggs, and Debora M. Katz, Council on Undergraduate Research 2002 National Conference, Connecticut College, New London, CT, June, 2002.

"Research Courses in Physics at the U. S. Naval Academy: An Approach to Undergraduate Research," Debora M. Katz and Mark L. Biermann, Council on Undergraduate Research 2002 National Conference, Connecticut College, New London, CT, June, 2002.

"Wien's Law and the Temperature of the Sun," Mark L. Biermann, Debora M. Katz, Robert Aho*, James Diaz-Barriga* and Jerome Petron*, Council on Undergraduate Research 2002 National Conference, Connecticut College, New London, CT, June, 2002.

"Valence Subbands in $Ga_{1-x}In_xAs/Ga_{1-y}Al_yAs$ Quantum Wells Under In-Plane Biaxial and Uniaxial Strain," Mark L. Biermann and W. S. Rabinovich, Quantum Electronics and Laser Science Conference 2002, Long Beach, CA, May, 2002.

“A Temperature Microclimate Study at Houghton and Fillmore, New York,” Annual Meeting and Scientific Paper Session of the Rochester Academy of Science, Finger Lakes Community College, Canandaigua, NY, November 1999.

“Undergraduate Research Programs Involving K-12 Students and Teachers,” Thirteenth National Conference on Undergraduate Research, University of Rochester, Rochester, NY, April 1999.

“Determining the Earth’s Shape and Size Using the Global Positioning System,” Poster Presentation by Nicholas Nelson* (Mark L. Biermann, mentor), Thirteenth National Conference on Undergraduate Research, University of Rochester, Rochester, NY, April 1999.

“Greenhouse Effect Correction Factor for Environmental Temperature Studies,” Oral Presentation by Laura L. Kolb* (Mark L. Biermann, mentor), Thirteenth National Conference on Undergraduate Research, University of Rochester, Rochester, NY April, 1999.

"An Environmental Science Research Project Involving Elementary Through Undergraduate Students," Annual Meeting and Scientific Paper Session of the Rochester Academy of Science, SUNY Geneseo, Geneseo, NY, November 1998.

"Environmental Science Research Opportunities: A Microclimate Research Project Involving Elementary Through Undergraduate Students," Workshop at the Council on Undergraduate Research Seventh National Conference, Occidental College, Los Angeles, CA, June 1998.

"A Microclimate Research Project Involving Elementary Through Undergraduate Students," Poster Presentation with Lois A. A. Biermann and students Jennifer Benson*, Mike Blanchard*, Jennifer Bohac*, Colleen Burrichter*, and Nate Lacher*, annual meeting of the Iowa Academy of Science, North Iowa Area Community College, Mason City, IA, April, 1998.

"Accuracy of Global Positioning System Devices," Poster Presentation with Lois A. A. Biermann and students Rebecca Daws* and Helen Schumacher*, annual meeting of the Iowa Academy of Science, North Iowa Area Comm. Coll., Mason City, IA, April, 1998.

"A Temperature and Wind Research Project Involving Elementary Through Undergraduate Students," fall meeting of the Iowa Section of the American Association of Physics Teachers, Central College, Pella, IA, November, 1997.

"Optical Special Effects: Whether You Want Them or Not," Invited Presentation for the Academic and Cultural Events Series, or ACES, Buena Vista University, Storm Lake, IA, November 1997.

"Beam Ratio and Image Quality in Low-Power, Reflection Holography," Invited Poster Presentation with student Brent L. Hild*, annual meeting of the Iowa Academy of Science, Clarke College, Dubuque, IA, April 1997.

"Effect of Beam Ratio on Image Quality in Reflection Holography," co-author with Brent L. Hild*, Argonne Symposium for Undergraduates, Argonne National Laboratory, IL, November, 1996.

"The Fuzzy Boundary Between Classical and Quantum Mechanics," SPS Physics Seminar, Gustavus Adolphus College, St. Peter, MN, October 1996.

"Microclimate Temperature and Wind Studies at Storm Lake: Connecting Research and Teaching," Poster Presentation, Sixth National Conference of the Council on Undergraduate Research, North Carolina Central University, Durham, NC, June 1996.

"Microclimate Temperature and Wind Studies at Storm Lake," Poster Presentation with students Stacy Cejka* and Lisa Rinkel*, annual meeting of the Iowa Academy of Science, Simpson College, Indianola, IA, April 1996.

"Light, Cameras and the Big Yellow Box," fall meeting of the Iowa Section of the American Association of Physics Teachers, Iowa State University, Ames, IA, 1995.

"The Infrared Rainbow, a Collaborative Teaching Experience," Poster Presentation with students Sarah Force* and Gregory Powers*, Murdock Trust Regional Conference on Undergraduate Research, Gonzaga University, November, 1994.

"Infrared Rainbows as a Collaborative Learning Experience," meeting of the Washington Section of the American Association of Physics Teachers, Washington State University, Pullman, WA, 1994.

"The Camera and the Human Eye," Invited Paper at the National Summer Meeting of the American Association of Physics Teachers, Notre Dame University, South Bend, IN, 1994.

"Optics and Your Camera: It's More Than Just a Few Pieces of Glass," meeting of the Washington Section of the American Association of Physics Teachers, Tacoma Community College, Tacoma, WA, 1993.

"The Human Eye and the Single Lens Reflex Camera: A Comparison," meeting of the Washington Section of the American Association of Physics Teachers, Whitworth College, Spokane, WA, 1992.

"Wave Packets in a Superlattice: Revivals and Other Phenomena," annual meeting of the Optical Society of America, Albuquerque, NM 1992.

"Wave Packets in a Semiconductor Superlattice," Integrated Photonics Research Topical Meeting, Monterey, CA 1991.

"Subband Structure for Narrow, Coupled Quantum Wells," annual meeting of the Optical Society of America, Boston, MA 1990.

"A K·p. Theory of Many-Layered Semiconductor Heterostructures," annual meeting of the Optical Society of America, Orlando, FL. 1989.

"A K·p. Theory of Many-Layered Semiconductor Heterostructures," The Institute of Optics Industrial Associates Meeting, Rochester, NY. 1989.

GRANTS

Research Assistance Grant: awarded grant to conduct research at the Max Born Institute, Berlin, Germany, for about one month, summer, 2007; funded through a grant from the host institution and the European Union; total award amount: (EURO) € 4,000.00 plus travel expenses.

Research Assistance Grant: awarded grant to conduct research at the Max Born Institute, Berlin, Germany, for about one month, summer, 2005; funded through a grant from the host institution and the European Union; total award amount: (EURO) € 4,000.00.

Awards to provide summer salary while conducting research on various projects related to modeling quantum wells and designing optical systems; funded by the Naval Research Laboratory through the NRL-USNA Cooperative Program for Scientific Interchange, July 2000, and June, July and August 2001, 2002 and 2003, total award amount: $54,509.93

The principal investigator of a research/science education project entitled "Temperature and Wind Microclimate Study at Storm Lake, IA"; funded by the Iowa Science Foundation, July 1997 to June 1998, award amount: $3,113.00.

A member of a committee that drafted a proposal to the Pew Charitable Trusts to fund a Pew Younger Scholars Program to encourage undergraduate research at Whitworth College; funded by The Pew Charitable Trusts, 1993-1996, award amount: $8,000.00.

Co-Principal Investigator/Senior Personnel on a proposal to gain Internet access for Whitworth College via NSFNET; funded by NSF, 1993, award amount: $23,000.00.

PROFESSIONAL ORGANIZATIONS AND ADVISORY COMMITTEES

Consultant, Lilly Fellows Program Expansion into the Natural and Social Sciences and Professional Fields, Fall 2017
Member of the Council on Undergraduate Research.
Board of Trustees, Taltree Arboretum, Valparaiso, IN, January 2015 to January 2016.
Appointed by the Governor of Iowa to serve on the STEM Advisory Council – STEM Northeast Regional Advisory Board, August 2012 to May 2014.
Elected Councilor, Physics and Astronomy Division, Council on Undergraduate Research, 2001 to present.

Member of the Government and External Relations Committee, 2007- 2009, and the Constitution and Bylaws Committee, 2001 - 2007, and 2009 - present of the Council on Undergraduate Research.
Member Governance Task Force, Council on Undergraduate Research, 2017-2018.
Panel chair for review of NSF CCLI grant applications, Arlington, VA, July 2009.
Member of the Spokane Economic Development Council, 1992-1994.
Member of the Manufacturing Design Curriculum Advisory Committee, Central Valley School District, Spokane County, WA, 1992-1995.
Member of Program Committee for the Initiatives in Technology Series of the Spokane Intercollegiate Research and Technology Institute, Spokane, WA, 1992-1994.
Member of the Intellectual Property Protection Committee of the Spokane Intercollegiate Research and Technology Institute, Spokane, WA, 1994-1995.
Board Member of the Washington State Science Olympiad and Co-Director of the 1995 Eastern Regional Washington State Science Olympiad Tournament, 1994-1995.

COURSES TAUGHT

Course numbers are not listed since numbering schemes vary from institution to institution. Instead, the courses are broken into three general categories. Note that I have taught courses in the following general disciplines: Physics, Astronomy, Chemistry, Mathematics, Engineering, Geology.

<u>General Education Courses</u>
Orientation to Engineering
Cartoon-Based, Concepts of Physics
Freshman Seminar: Dr. Suess and Engineering
Concepts of Astronomy (with lab)
Astronomy (no lab)
Intermediate Algebra
General Physical Science
General Physical Science Laboratory
Introductory Geology
Freshman Seminar: Aerodynamics and the Boeing 777
Architecture and Culture in Northern Europe

<u>Introductory-Level Courses for Physics Majors and Non-Physics Majors</u>
Techniques of Physics Research
College Physics I and II (Algebra/Trigonometry based, no lab)
College Physics I and II (Algebra/Trigonometry based, with lab)
General Physics I, II and III (Calculus based, with lab)
Engineering Mechanics: Statics
Mechanics of Materials

<u>Upper-Level Courses for Majors</u>
Optics
Physical Chemistry I
Quantum Mechanics

Senior Seminar in Mathematics and Physics
Classical Mechanics
Electricity and Magnetism
Atomic and Molecular Physics
Physics Project Laboratory
Physics Senior Seminar
Twentieth Century Physics
Physics of the Atom I
Physics of the Atom II
Research in Physics

About 27 different courses and 14 different laboratories.

HONORS AND AWARDS
Kodak Scholar Scholarship; Rochester Centennial Award Scholarship; Aid Association for Lutherans All College Scholarship; SPIE College Scholarship; National Dean's List all semesters; member Tau Beta Pi Engineering Honor Society; Secretary of University of Rochester branch of Tau Beta Pi, Phi Beta Kappa; Co-winner of Senior Optics Award, University of Rochester; Robert L. and Mary Sproull Fellowship; Perkin-Elmer Fellow; Award for Outstanding Young Faculty Member, Whitworth College, 1994-1995; Eastern Kentucky University College of Arts and Sciences Excellence in Research and Creative Activities Award, 2007 (one of three awarded in the college of 275 faculty).