College of Natural Science and Mathematics

Degree Candidates
Joan Braddock, Dean

Baccaulaureate

Seth Adams	B.S.	Biological Sciences
Darren A. Asuncion	B.S.	Computer Science
Rebecca Baird	B.S.	Biological Sciences
Christopher Paul Barger	B.S.	Biological Sciences
James R. Becwar	B.S.	Computer Science
Aaron Edward Behnen	B.S.	Computer Science
Molissa Bifelt	B.S.	Mathematics; Statistics
Mary Buchanan	B.S.	Mathematics
Lillian Ann Capell	B.S.	Biological Sciences
Erin Leigh Carr	B.S.	Wildlife Biology
Eric Cray	B.S.	Computer Science
Russell deForest	B.A.	Mathematics
Wallace Drumhiller	B.S.	Marine Medical Pharmacology: Interdisciplinary Program
Joel Eichler *Golden Key Honor Society*	B.S.	Mathematics
Gabriel P. Emerson *Golden Key Honor Society*	B.S.	Computer Science
Lauren Esmailka	B.S.	Biological Sciences
Joseph Norman Filla	B.S.	Biological Sciences
Raena J. Fites *summa cum laude*	B.S.	Chemistry
Tracy Michelle Fourreaux	B.S.	Biological Sciences
Eric Galloway *cum laude*	B.S.	Mathematics
Noah B. George *cum laude, Golden Key Honor Society*	B.S.	Physics

Elise Glenn	B.S.	Biological Sciences
Brian Gregory *Golden Key Honor Society*	B.S.	Biological Sciences
Saranna Rae Hack	B.S.	Computer Science
Brian C. W. Hall	B.S.	Physics
Stacie G. Hall	B.S.	Biological Sciences
Richard James Hallock	B.S.	Biological Sciences
Shannon A. Hammond *cum laude*	B.S.	Mathematics
Gussie Paniuq Ivanoff *Honors Program*	B.S.	Biological Sciences
Melissa Ann Jasper	B.S.	Biological Sciences
Eric Jensen	B.S.	Mathematics
Eric Johnson	B.S.	Computer Science
Kevin Jones	B.S.	Computer Science
Kimberly D. Jones	B.A.	Biological Sciences
Valerie J. Joyce *magna cum laude, Student Ambassador*	B.S.	Biological Sciences
Alice Kangas	B.S.	General Science
Sarah Linda Keefer *Honors Program*	B.S.	Biological Sciences
Martin L. Keller	B.S.	Computer Science
Josh L. Klynstra	B.S.	Chemistry
David Kwasinski *magna cum laude, Golden Key Honor Society*	B.A.	Biological Sciences
Tiffany M. Larson *Student Leadership Honors, Student Ambassador*	B.S.	Biological Sciences
Michael Lelevier	B.S.	Wildlife Biology
Dane Lenaker *magna cum laude, Honors Program, Student Ambassador*	B.S.	Biological Sciences
Lonita A. Lohse	B.S.	Chemistry

Aaron Luptak *cum laude, Honors Program, Golden Key Honor Society*	B.S.	Computer Science
Scott Macfarlane	B.S.	Computer Science
Stephanie D. Maggard	B.A.	Naturopathic Chemistry: Interdisciplinary Program
Jeffrey M. Mann	B.S.	Mathematics; Physics
Clifford Manning	B.S.	Computer Science
Ryan McAllister	B.S.	Mathematics
Lisa M. McGilvary *cum laude*	B.S.	Biological Sciences
Cody Mutchler	B.S.	Computer Science
Dayna Norris	B.S.	Biological Sciences
Michael W. Nowakowski	B.A.	Earth Science
Chelsea Dianne Paskvan *Honors Program*	B.S.	Chemistry: Biochemistry/Molecular Biology
Shanna Katharine Patterson	B.S.	Biological Sciences
Charles R. Pengilly	B.A.	Mathematics
Christopher John Peterson	B.S.	Biological Sciences
Eric Richard Peterson *cum laude, Golden Key Honor Society*	B.S.	Computer Science
Zachary Nathaniel Pickett *Golden Key Honor Society*	B.S.	Chemistry: Biochemistry/Molecular Biology
David Kenneth Poole	B.S.	Geology
Myrna Rae Ridenour	B.S.	Biological Sciences
Cheryl Lynne Robar *cum laude, Golden Key Honor Society*	B.S.	Geology
Ivan Romanovskiy	B.S.	Geology
John Glenn Rowley *magna cum laude*	B.S.	Chemistry
Christopher A. Rushing	B.S.	Computer Science
Davin Simmons	B.S.	Computer Science
Ray S. Smith	B.S.	Computer Science

William A. Smith II	B.A.	Earth Science
Trooper R. A. Snow	B.A.	Biological Sciences
Benjamin Soiseth	B.S.	Wildlife Biology
Chad C. Stadig	B.S.	Computer Science
Melissa Stefan	B.S.	Mathematics
Dianna C. Steiner	B.S.	Biological Sciences
Kathryn R. Stephan	B.S.	Chemistry: Biochemistry/Molecular Biology
Timothy E. Stern	B.S.	Applied Physics: Computational Physics
Leah Swasey	B.A.	Biological Sciences
H. B. Telling *Honors Program*	B.S.	Physics
Melessia Todd	B.S.	Biological Sciences
William E. Tweet *cum laude*	B.S.	Remote Geologic Resource Development: Interdisciplinary Program
Luzmila Juanita Valadez	B.S.	Biological Sciences
Joseph P. VanHoomissen *cum laude*	B.S.	General Science
Alice Hilde Velsko *cum laude, Honors Program, Golden Key Honor Society, Phi Kappa Phi Honor Society*	B.S.	Biological Sciences
Tihele Lee Walkowsky *cum laude*	B.S.	Biological Sciences
James V. Warner *cum laude, Honors Program*	B.S.	Biological Sciences
Patrick Webb	B.S.	Computer Science
Melissa Weisenburg	B.S.	Biological Sciences
Kevin Lewis Whitworth	B.S.	Wildlife Biology
Alex Wolfe	B.S.	Computer Science

Master's

Jennifer N. Adleman *B.S., University of Washington, 2000*	M.S.	Geology

Benjamin James Andrews *B.S., University of Oregon, 2002*	M.S.	Geology
Sean Patrick Bemis *Honors Program* *B.S., University of Alaska Fairbanks, 2001*	M.S.	Geology
Jeffrey A. Bickmeier *B.S., University of Alaska Fairbanks, 1999*	M.S.	Biochemistry and Molecular Biology
Tim Carlson *B.A., University of California, 1999* *B.S., University of California, 1999*	M.S.	Mathematics
Merben Rellen Cebrian *B.S., University of Alaska Fairbanks, 2001*	M.S.	Wildlife Biology
Christopher Crewdson *B.S., University of Alaska Fairbanks, 2003*	M.S.	Computer Science
Brian Englund *B.S., University of Alaska Fairbanks, 2002*	M.S.	Chemistry
Igor Filippov *Diploma, Ural State University of Economics (Russia), 2001*	M.S.	Mathematics
Emily Suzanne Finzel *B.S., University of Wisconsin, 2000*	M.S.	Geology
Michael Robert Hayes *B.S., University of Wisconsin, 1996*	M.S.	Geology
Jeffrey Morgan Holmes *B.S., University of Texas, 1998*	M.S.	Space Physics
Kalin Ann Kellie *B.S., University of Alaska Fairbanks, 1999*	M.S.	Wildlife Biology
Landon Neal Kelly *B.S., Illinois State University, 2000*	M.S.	Geology
Scott W. Kemp *Golden Key Honor Society* *B.S., University of Alaska Fairbanks, 2003*	M.S.	Biochemistry and Molecular Biology
Cynthia Gail Kirkham *B.S., University of Cincinnati (Ohio), 2000*	M.S.	Geology
Amber Lea Klaas *B.S., Truman State University (Missouri), 2000*	M.S.	Biology
Jonathan Paul Klaas *B.S., Truman State University (Missouri), 2000*	M.S.	Physics

Michael J. Knoche *B.S., University of Alaska Fairbanks, 1997*	M.S.	Wildlife Biology
Katrina Kay Knott *B.A., University of Minnesota, 1997*	M.S.	Zoology
Mary R. Lee *B.S., University of Alaska Fairbanks, 2002*	M.S.	Chemistry
George P. Lee III *B.S., University of Alaska Fairbanks, 2002*	M.S.	Chemistry
Mark Lisee *B.S., University of Massachusetts Lowell, 1988*	M.S.	Computer Science
Patricia F. Loomis *B.A., State University of New York, 1999*	M.S.	Biology
Susanne Lyle *B.S., University of Alaska Fairbanks, 1998*	M.S.	Biology
Ipshita Majhi *B.E., University of Pune (India), 1999* *M.S., University of Alaska Fairbanks, 2002*	M.S.	Atmospheric Sciences
Laurie A. Martin *B.S., University of Alaska Fairbanks, 2000*	M.S.	Forensic Chemistry: Interdiciplinary Program
Danielle Mather *B.S., University of Wisconsin, 1995*	M.S.	Wildlife Biology
Colin McGill *B.S., University of Alaska Fairbanks, 2001*	M.S.	Chemistry
Steven M. Mullins *B.S., Regis College (Colorado), 1996*	M.S.E.	
Isla Myers-Smith *B.S., University of British Columbia (Canada), 2002*	M.S.	Biology
Jonathan Andrew O'Donnell *B.S., Elizabethtown College (Pennsylvania), 2000*	M.S.	Biology
Randolph G. Phillips *B.S., Clarkson University (New York), 2001*	M.S.	Statistics
Sharon E. Pitiss *B.S., State University of New York, 2000*	M.S.	Geophysics
Safia Rawoot *B.S., University of Virginia, 2001*	M.S.	Computational Physics
Melissa Anne Robinson *B.S., University of Montana, 2002*	M.S.	Wildlife Biology

Ronald Allan Robinson *B.S., University of Alaska Fairbanks, 2001*	M.S.E.	
Jennifer Rohrs *B.A., University of Colorado, 1999*	M.S.	Biology
Kristen Bartecchi Rozell *B.A., University of Colorado, 1994*	M.S.	Wildlife Biology
Joshua Harold Schmidt *B.S., Michigan State University, 1998*	M.S.	Wildlife Biology
Steven James Smith *B.S., Indiana University of Pennsylvania, 2001*	M.S.	Geology
Sushma Sonwalkar *B.S., Ravishankar University (India), 1982* *M.A., Ravishankar University (India), 1985* *M.Phil., Mohanlal Sukhadia University (India), 1987* *B.Ed., Ravishankar University (India), 1996*	M.S.	Computer Science
Lindsay Ann Szramek *B.A., Bowdoin College (Maine), 2002*	M.S.	Geology
Kenneth D. Tape *B.A., Carleton College (Minnesota), 1999*	M.S.	Geology
Zachary John Wenz *B.S., University of Minnesota, 2002*	M.S.	Geology
Lily J. Wong *B.S., University of California, 2001*	M.S.	Geology
Justin David Yonker *B.A., University of Pittsburgh (Pennsylvania), 1999*	M.S.	Space Physics
Christopher David Young *B.S., University of Alaska Fairbanks, 2003*	M.S.	Computer Science
Xiaoming Zhang *B.S., Xiamen University (China), 1995* *M.S., University of Alaska Fairbanks, 2001*	M.S.	Computer Science

Doctoral

Richard E. Brenner *B.S., University of Alaska Fairbanks, 1996* **Thesis: Nitrogen Transformations and Retention During a Deciduous to Coniferous Successional Transition**	Ph.D.	Biological Sciences: Biology

The availability of soil nitrogen often limits plant productivity in the boreal forest. I examined the release and retention of soil nitrogen in stands of balsam poplar and white spruce. Both stand types were found to be sensitive to nitrogen inputs which quickly resulted in nitrogen leaching below the main rooting zone.

Major Professor: Dr. Richard D. Boone

Brandon L. Browne Ph.D. Geology

B.S., Oregon State University, 1998
B.S., Oregon State University, 1998
M.S., University of Alaska Fairbanks, 2001

Thesis: Petrologic and Experimental Constraints on Magma Mingling and Ascent: Examples From Japan and Alaska
In between volcanic eruptions, magma is stored in shallow chambers that are sustained by episodic intrusions of hotter magma from depth. Magma is further modified via crystallization and degassing during eruption in response to changes in confining pressure as it rises to the surface. What eventually erupts at the surface then, are hybrid magmas with complex mineral assemblages and textures that record valuable information about the magma's history.

Major Professor: Dr. John C. Eichelberger

Sara S. Dirscherl Ph.D. Biochemistry and Molecular Biology

B.S., Metropolitan State College (Colorado) 1996
M.S., University of Alaska Anchorage, 2001

Thesis: Expression and Function of the ATP Dependent Chromatin Remodeler Imitation Switch in *Xenopus Laevis*
Human cells contain two meters of DNA, which must be compacted to fit into the nucleus. Gene expression requires access to compacted DNA. I have been studying how the chromatic remodeler imitation switch functions during development to control gene expression and normal development of the eye and nervous system.

Major Professor: Dr. Jocelyn E. Krebs

Teresa Hollingsworth Ph.D. Biological Sciences: Biology

B.A., University of Colorado Boulder, 1997
M.S., Lancaster University (United Kingdom), 2000

Thesis: Quantifying Variability in the Alaskan Black Spruce Ecosystem: Linking Vegetation, Carbon and Fire History
In Interior Alaska, black spruce is the predominant tree species and spans a wide range of habitats. This research uses a combination of site description and analysis both locally and from across a large region to answer questions about the regional variability, ecosystem parameters and biodiversity of this forest type.

Major Professors: Dr. F. Stuart Terry Chapin III and Dr. Marilyn Walker

Sigrun Hreinsdottir Ph.D. Geophysics

B.S., University of Iceland, 1997
M.S., University of Iceland, 1999

Thesis: Coseismic Deformation of the 2001 El Salvador and 2002 Denali Fault Earthquakes from GPS Geodetic Measurements
GPS geodetic measurements are used to study two major earthquakes. For the 2001 Mw7.7 El Salvador earthquake, six continuous operating GPS stations in Central America are used to constrain earthquake parameters. For the 2002 Mw7.9 Denali Fault earthquake, 232 GPS sites in Alaska and Canada are used to reveal a detailed slip distribution.

Major Professor: Dr. Jeffrey T. Freymueller

Prasad R. Joshi — Ph.D. — Biochemistry and Molecular Biology

B.S., Unversity of Bombay (India), 1998
M.S., University of Bombay (India), 1999

Thesis: Structure-Function Studies of the Serotonin Type-3 Receptor Ligand-Binding Domain
The 5-HT3R, an ion channel, mediates physiological processes in nervous, cardiovascular and digestive systems. Our studies explored the contribution of binding site loops B and E to the mechanism of channel gating in the 5-HT3R. These studies show that loops B and E play a critical role in ligand specificity and mechanisms of channel opening and desensitization.

Major Professor: Dr. Marvin K. Schulte

North F. Larsen — Ph.D. — Atmospheric Sciences

B.S., Evergreen State College (Washington), 1990
M.S., University of Alaska Fairbanks, 1994

Thesis: Cloud Detection and Trace Gas Retrieval From the Next Generation Satellite Remote Sensing Instruments
A cloud detection algorithm for the future National Polar Orbiting Environmental Satellite System (NPOESS) Visible Infrared Imaging Radiometer Suite (VIIRS) sensor has been developed, and methods for atmospheric trace gas retrieval for future satellite remote sensing instruments. These methods of trace gas retrieval improve current techniques for the retrieval of atmospheric water vapor and methane.

Major Professor: Dr. Knut Henrick Stamnes

Michelle M. McGee — Ph.D. — Geology

B.S., University of Wisconsin, 1997
M.S., University of Wisconsin, 1999

Thesis: Carboniferous Lisburne Group Carbonates of the Porcupine Lake Valley: Implications for Surface to Subsurface Sequence Stratigraphy, Paleogeography, and Paleoclimatology
This study utilizes high-resolution stratigraphy and sequence stratigraphy to document the response of the Carboniferous Lisburne Group carbonate platform during a change from greenhouse to icehouse conditions. I identified six depositional sequences and corresponding systems tracts within the Lisburne Group based on bounding surfaces, cycle stacking patterns and lateral lithofacies relationships.

Major Professor: Dr. Michael T. Whalen

Kevin Petrone Ph.D. Biological Sciences: Biology

B.A., Hampshire College (Massachusetts), 1993

Thesis: Export of Carbon, Nitrogen and Major Solutes from a Boreal Forest Watershed: The Influence of Fire and Permafrost
Detailed chemistry observations were used to determine the role of fire, permafrost and snowmelt processes on element fluxes from interior Alaskan catchments. Fire had a short term effect on stream chemistry, and hydrochemical differences were found between watersheds due to permafrost, suggesting that Alaskan watersheds may be fundamentally different from their boreal and temperate counterparts.

Major Professors: Dr. Richard Boone and Dr. Jeremy Jones

John Jairo Sanchez-Aguilar Ph.D. Geophysics

B.S., La Universidad Caldas (Colombia),1996
M.S., University of Alaska Fairbanks, 2000

Thesis: Volcano Seismology from Around the World: Case Studies from Mount Pinatubo (Philippines), Galeras (Colombia), Mount Wrangell and Mount Veniaminof (Alaska)
We study volcanoes investigating b-values, velocities, complex frequencies and earthquake interactions. Results show complicated structures. Dikes and shallow hydrothermal system may exist under Mount Veniaminof. Responses of Wrangell and Veniaminof volcanoes following the Denali earthquake suggest long-lasting effects. We conclude that simple methods allow studying volcanoes regardless of logistics limitations.

Major Professor: Dr. Stephen Russell McNutt

Bing Shi Ph.D. Biochemistry and Molecular Biology

B.S., Tsinghua University (China), 1989
M.S., Tsinghua University (China), 1992

Thesis: Tribological Comparison of Materials
The performance of materials for Total Replacement Artificial Joint and cell growth was studied from both a tissue engineering and tribological perspective in order to improve artificial joint devices. Results showed some materials had good characteristics as joint implant coatings and substrates for preparing total joint implants via tissue engineering.

Major Professor: Dr. Lawrence K. Duffy

Asha Suryanarayanan Ph.D. Biochemistry and Molecular Biology

B.P., University of Mumbai (India), 1997

Thesis: Analysis of Structure and Function of the Serotonin Type-3 Receptor Using Site Directed Mutagenesis, Structure Activity Relationship and Chimeric Constructs
The serotonin type-3 receptor (5-HT3R) is a ligand-gated ion channel that is important in several physiological and pathophysiological processes. Here, interactions of both agonists and antagonists with the 5-HT3R were studied using site-directed mutagenesis, SAR and chimeric constructs. These studies reveal an emerging picture of ligand interactions with the 5-HT3R.

Major Professor: Dr. Marvin K. Schulte

Catherine Copass Thompson — Ph.D. — Biological Sciences: Biology

B.S., Standford University (California), 1994
M.S., Stanford University (California), 1995

Thesis: Vegetation-Climate Interactions Along a Transition From Tundra to Boreal Forest in Alaska
The climate of the Alaska Arctic is warming more rapidly than at any time in recent history. We examined the interactions between climate and ecosystem structure and function across a gradient of vegetation types from arctic tundra to boreal forest in Alaska using a combination of field studies and modeling.

Major Professor: Dr. David McGuire

Likun Wang — Ph.D. — Atmospheric Sciences

B.S., Peking University (China), 1996
M.S., Peking University (China), 1999

Thesis: Midlatitude Cirrus Cloud Structural Properties Analyzed from the Extended Facility for Atmospheric Remote Sensing Dataset
The cirrus inhomogeneous properties have been evaluated by lidar dataset. The means to analyze lidar data using wavelet analysis has been developed. And then, typical cirrus structures including Kelvin-Helmholtz instabilities, mammata, and uncinus cells and a climatology of cirrus inhomogeneous properties are analyzed from lidar backscattered power.

Major Professor: Dr. Kenneth Sassen

Chris L. Whittle — Ph.D. — Chemical Ecology: Interdisciplinary Program

B.S., California State University, 1987
M. S., University of Alaska Fairbanks, 1999

Thesis: Identification and Function of Male Moose Urinary Phermones
During rut, urine of adult male moose is a chemical signal that relays information to female moose. To aid in the identification and function of male moose urinary pheromones, behavioral bioassays were conducted. Putative pheromone(s) were characterized; evidence that females utilize the main olfactory system to detect chemosignals was provided.

Major Professor: Dr. Thomas P. Clausen

Ryan Woodard — Ph.D. — Physics

B.S., Georgia Institute of Technology, 1989
M.S., Georgia Institute of Technology, 1992

Thesis: Building Blocks of Self-Organized Criticality
Why are we having difficulty developing economical nuclear fusion? How can a squirrel cause a statewide power blackout? How do correlations arise in a random complex system? How are these questions related? This research breaks new ground in addressing these questions through a study of self-organized criticality.

Major Professor: Dr. David E. Newman