

College of Engineering and Mines

Fahimeh Dehghani *

Ph.D. Engineering: Mining Engineering

To decrease water consumption in flotation circuits, solid percent in the pulp increased. Increasing solid percent negatively affects the flotation performance. These effects were investigated. To optimize the flotation performance, several parameters were tested and controlled. They included the type and dosage of the chemicals, pH/Eh, bubble sizes and turbulence.

College of Fisheries and Ocean Sciences

Monica Elizabeth Brandhuber

Ph.D. Fisheries

Polar bears are threatened by climate change in the wild and experience only moderate reproductive success in zoos. A suite of understudied reproductive and metabolic hormones in wild and zoo-housed female polar bears was characterized to better understand estrus and predict reproductive success.

Kari Hammarsten Fenske **

Ph.D. Fisheries

Anoplopoma fimbria

Sablefish are a highly valued fish with complex spatial population dynamics that make management challenging. A spatial population model and spatial simulation models were developed to inform managers about spatial abundance and sustainability, alternative methods to divide harvest opportunity were examined, and tradeoffs among harvest opportunity alternatives were shown.

Amy Lorraine Kirkham *

Ph.D. Fisheries

To characterize regulation of annual reproduction, mass change and molt in female Antarctic Weddell seals (*Odobenus rosmarus*), hormone concentrations and nutritional status in relation to these processes were assessed. Hormone and mass dynamics varied with recent reproductive history, altering seasonal patterns in seals that skipped reproduction in a given year.

Thilo Klenz

Ph.D. Oceanography: Physical

Alexis M. Walker **
Ph.D. Marine Biology

Michael James Letzring *

Ph.D. Historical Geography: Interdisciplinary Studies

Russell W. Vander Lugt *

Ph.D. Arctic and Northern History: Interdisciplinary Studies

In 1885, Lt. Henry Allen crossed Alaska, surveying 2,500 miles of Dene territory along the Copper, Tanana and Koyukuk rivers. Allen, with Dene support, documented the social and physical environment of Alaska's Interior. Mutual respect between Allen and Alaska's Dene played an integral role in the expedition's success.

Eduard Zdor

Ph.D. Anthropology: Culture

An ethnographic portrait was drawn of Chukotkan communities a century past the time of Bogoras. Subsistence remains a great factor in shaping the Chukchi identity. However, they are also integrated within a global society. The clash of influences gives rise to a complex pattern of human passions and life goals.

Amenah Arabi **

Ph.D. Biochemistry and Neuroscience: Biochemistry

Drew Alexander Coffin
Ph.D. Space Physics

The System IV rotational periodicity at Jupiter maps to a persistent subcorotation within the Io plasma torus. The author proposed that this periodicity's origin is from superthermal electrons within the torus, energized by Alfvén waves to the planet. Also explored were consequences for Jovian aurora and moons.

Federico Covi **
Ph.D. Geophysics

In situ observations and satellite images were used in conjunction with local and regional scale numerical modeling to investigate melt and subsurface processes in the percolation zone of the Greenland ice sheet.

Julia Elisabeth Gestrich **
Ph.D. Geophysics: Solid Earth Geophysics

To connect seismic tremor to physical eruption properties, a river seismicity model was adapted and applied. Infrasonic signals during sustained eruptions were compared to anthropogenic jet noise spectra to confirm volcanic jet noise. The connection between infrasonic and lava fountain dynamics was analyzed using jet noise scaling laws.

Jordan R. Jenckes
Ph.D. Geoscience

The hydrogeochemistry of freshwater discharged to the Gulf of Alaska is not well understood. To close the knowledge gap, a unique set of stream samples compiled from across the Gulf of Alaska watershed was utilized. Glacier coverage, watershed slope and geology are important controls on the variability of freshwater geochemistry.

Jaewoong Jung *
Ph.D. Physics

The exospheric density at 10 Earth radii was estimated, which can help explain atmospheric loss due to the space environment and infer the evolution of Earth's atmosphere. A model was also developed for predicting soft X-ray images by parameterizing key parameters in the magnetosheath, which could aid future satellite missions.

Jishnu K. S. Krishnan **
Ph.D. Biochemistry and Neuroscience: Neuroscience

Skeletal muscular contractility and fatigue resistance in ex-vivo muscle tissues after being subjected to hypothermic stress were studied. Results showed that diet and hypothermic stress can alter various functional features of skeletal muscle, and summer-active AGS is more fatigue resistant than mid-torpor AGS.

Emilie Morrell
Ph.D. Biochemistry and Neuroscience: Biochemistry

Worldwide, one in three people have non-alcoholic fatty liver disease; however, treatment options for this disease are limited. The impacts of biometals homeostasis, dietary fructose intake and sex on NAFLD pathogenesis were examined to identify potential mechanisms and pathways that could be targeted for the development of future therapies.

Jefrey Park **
Ph.D. Mathematics

Controllability was investigated for three separate non-self-adjoint systems of partial differential equations: N one-dimensional coupled wave equation, the vector Schrödinger equation on the interval with a non-self-adjoint matrix potential, and the beam equation on an interval. The inverse problem for the second system was also solved.

Anna Rix **

Ph.D. Biological Sciences

Millions of years of evolution under extreme conditions have shaped the genetics of high-latitude fishes. Patterns of genetic variation in two evolutionarily distant types of high-latitude fishes were examined to enhance predictions of how these animals may respond to future environmental changes.

Karen Joy Spaleta **

Ph.D. Geoscience: Geology

A detailed mineralogical and elemental composition analysis of gold mill extraction samples from the Pogo Mine mill (Interior Alaska) and the Golden Sunlight Mine mill (Whitehall, Montana) evaluated potential sources of the critical minerals tellurium and bismuth that are necessary to meet increasing global demand for carbon-neutral energy production goals.

Andrew Thanh Vu *

Ph.D. Physics

Interactions between solar wind and foreshock particles can form foreshock transients upstream of planetary bow shocks. Statistical studies of spacecraft observations and numerical simulations revealed their properties and formation mechanisms. This allows for the construction of a kinetic model and the ability to forecast their particle acceleration and geoeffects.

Yuanyuan Zhao **

Ph.D. Mathematics

This thesis proved exact controllability of the wave equation on tree graphs and graphs with cycles. It also described the dynamical leaf peeling method, which is used to recover the connectivity, potential function on a tree graph, and the lengths of its edges from the response operator given on a finite time interval.

Lyla June Johnston **

Ph.D. Indigenous Studies

Eleven Indigenous food and land management systems were examined to elucidate patterns and techniques. Indigenous land managers were interviewed for deeper perspectives. A theory of Indigenous regenerative ecosystem design and policy recommendations was offered. The work closed with an analysis of how precolonial histories are distorted and hidden.

Angela Alsta Lunda **

Ph.D. Indigenous Studies