Department artist Mary Diman recommended we use blues and grays for the fabric to blend with the brown walls. Workers arrived just at the end of the last class day of the fall term. Ben Abernathy and Bill Unger did a huge amount of work readying the room for the workers.

### ❖ Dave Mickelson

The glacial geology program continues to be very active. Our Southern Laurentide Ice Sheet (SLIP) is in the second year of a three-year grant. We are mapping landforms (mostly done by former PhD student, **Pat Colgan** and grad student **Kelly LaBlanc**) in the area covered by the LIS and using them to ground truth a computer model that has been adapted by **Paul Cutler**. Unfortunately for us, Paul has taken a position with the National Academy. Congratulations, Paul! We were fortunate to obtain funding on another NSF grant to work in Norway with **Eiliv Larsen** and others on reconstructing ice thickness during the glacial maximum. **Matt Hildreth** finished his thesis on using preconsolidation to reconstruct ice thickness there. **Cornelia Winguth**, who did her PhD on sediments in the Black Sea, will work on that project, which begins this spring. Other on-going projects include a shore erosion study through geological engineering, supervising two students **(Jeff Munroe and Eric Carson)** who are working in the Uintas (**Danny Douglass** finished his thesis there in June), and mapping of Door County with another grad student, **Scott Brown**. **Dawn Chapel** finished her thesis on central Sheboygan County last spring and hopefully present student **Anders Carlson** will finish mapping the southern part next summer. **Mike Kaplan**, a Weeks postdoc working on the chronology of moraines in Argentina with Brad Singer has added expertise and enthusiasm to the Quat group since arriving in September.

As I look back over 30 years of research, I realize how many things we don't understand about the vertical and horizontal extent of ice during the last glacial maximum. In addition to estimating ice thickness in the two of the projects mentioned above, I am considering starting research on the same question for the Tibetan Plateau. Vin and I spent a wonderful three weeks in China and Tibet last June and hope to go back. Last summer, we also had a great modern glaciers class in Iceland. Eighteen of us spent two weeks exploring ice margins in southwest Iceland. Formerly on these trips we used cars, but this year a big, four-wheel drive bus made interesting places more accessible. A number of former Quats donated money to help pay expenses of students. Thanks to **Kent Syverson, Doug Connell, Pat Colgan, Alan James, Bill Simpkins, Lisa Bona, Larry Acomb, Scott Stanford** and **Nelson Ham** for helping with student expenses. Debris incorporation and transport in glaciers also continues to interest me. In March I attended a field conference organized by long time friends **Dan Lawson** and **Ed Evenson** and others at the Matanuska Glacier.

The Geological Engineering Program continues to flourish. It was accreditation year for the Engineering School, so that was a time consuming job! I enjoy being Chair, but hope we won't have another year that is as work intensive as the last. The accreditation site visit in November prevented my attending GSA in Reno, but I hope to see many of you in Boston next fall.

### ❖ Nita Sahai

Fall 2000 was my first semester as an assistant professor. It has been an exciting and challenging transition from post-doctoral researcher to professor, and from the East Coast to the Mid-West. So, first of all, I would like to thank the faculty, staff and students who have welcomed me to this excellent department and have helped me settle in. Since then, I have had many opportunities for personal growth in terms of learning about advising students, finding time for activities (other than my own research) such as teaching, advising, working on committees, and setting-up the labs.

As some of you may already know, my research interests span the fields of geochemistry, biochemistry, and materials science. I am interested in a molecular-level understanding of reactions between organic and inorganic compounds in water, at surfaces of minerals, and as effected by microorganisms. Such reactions are of fundamental geochemical interest and also have fascinating applications in such diverse fields as environmental, clinical medicine and materials science. Our approach is to use both theoretical modeling (classical thermodynamics and quantum chemical molecular orbital theory) as well as experimental techniques (IR/Raman, x-ray Absorption, and NMR spectroscopy, and analytical chemistry). One of the major thrusts of our research is the innovative application of molecular orbital calculations as an effective new tool for studying biomineralization and interfacial reactions. For example, we are currently studying how diatoms precipitate out amorphous silica from ocean water to build their tests in such a fascinating diversity of physical shapes and forms. Diatoms are algae (yes, they are microbes just as much as bacteria, fungi, viruses and protozoa are!) that are responsible for cycling 6.7 gigatonnes of silicon annually, and thus play a vital role in the biogeochemical cycling of the most abundant cation at the earth's surface. As the mineral that constitutes our bones and teeth, apatite is the biomineral that we are most intimately associated with. So we are also working on the growth of apatite on bioceramic silica surfaces used as prosthetic implants (artificial joints, dental implants, etc.). The neat aspect of this work is that the fundamental chemistry underlying this process is just as applicable to understanding how nodular phosphorite deposits are formed.

My research efforts this past semester have focussed mainly on setting up an aqueous geochemistry laboratory and a computer lab for theoretical geochemical modeling, and on writing research proposals. I am pleased to report that the laboratory renovations are already underway, and with any luck, should be completed by the end of the spring. We have also installed a four node eight-CPU PC cluster set up to run in parallel. This cluster gives us the computational muscle to wrestle with theoretical calculations for molecules involving organic and inorganic moities. A third project involves the development of a model for predicting the extent of ion adsorption on mineral surfaces, with an internally-consistent thermodynamic database. One of the applications is in understanding how toxic metals can be retarded along groundwater flow paths. I was pleased that five new papers related to these projects saw the light of publication this year and two more are in review.

I also invested a lot of time in preparing the Introductory Geochemistry course (and thoroughly enjoyed teaching it), and also the Crystal Chemistry course (which I am currently co-teaching with Prof. Jill Banfield).

Although I do not yet have graduate students of my own, I was involved in informal advising of some geomicrobiology graduate students from Prof. Banfield's group, and from the Chemistry and Civil Engineering departments.

I am very excited to have been invited to present a talk and a paper for a book at the prestigious NATO Advanced Research Workshop Series. The workshop is entitled "Seeking Answers for Fundamental Questions in Ion Adsorption at the Oxide/Electrolyte Interface", and will happen in fall 2001 in Dubrovnik (Croatia), known as the "Pearl of the Mediterranean." My research is interdisciplinary, and I expect that I will be collaborating with scientists both within UW and outside. In this light, I have been invited to collaborate with Prof. Dr. Glimcher of Harvard Medical School, using my theoretical calculations to help determine the reaction sequence by which bone grows in vertebrates. In the near future, I intend to build a research group, taking on graduate students, a post-doctoral research associate, and potentially, a motivated undergraduate student to work on some of these projects and on ideas of their own.

### ❖ Toni Simo

2000 was a productive year, both in the research and teaching fronts. It looks like I have imitated the cyclic nature of the carbonates I study and got seven publications in the top peer review journal, two guidebooks, advised six PhD, three MS, three undergraduate theses, one postdoc, and taught the largest number of classes in one year. I was also busy traveling with included with fieldwork, attending meetings/workshops, giving invited talks to different universities, and visiting my family in Barcelona. Departmental committee work was intense. I really enjoyed chairing the Museum Committee at a time of change and growth, and the Graduate Studies Committee. If cycles work in life as in rocks, next year should be a relaxing one in Barcelona during my partial sabbatical.

My research approach continues to be "problem solving" and these days I am integrating field, petrographic, geophysical work. My students and I are actively working through the geologic column (from Paleozoic to Recent rocks) in the US, Spain, Venezuela, Indonesia, and Australia. I am still working in sequence stratigraphy and sedimentology, in paleoceanography and paleoclimate, and in carbonate hydrostratigraphy. Work in hydrostratigraphy includes research continuous work in mechanical stratigraphy, retaking an old topic of arsenic contamination by naturally occurring mineralization in Wisconsin, and salt intrusion in deltas.

### ❖ Brad Singer

The Rare Gas Geochronology Laboratory was commissioned in April 2000 with considerable help from Lee Powell and Bill Unger. *(See a lab dedication article on page 33.)* We completed nearly 5000 argon isotope analyses during the remainder of the year focusing on several projects. Monica Relle discovered a new and very complete record of the 580 ka Big Lost Polarity Event during her MS thesis study of lavas on La Palma, in Spain's Canary Islands. Mike Smith, Alan Carroll and I collected samples of ash beds in the Green River Formation, Wyoming during the summer. Initial 40Ar/39Ar ages from several of these tuffs obtained by Mike for his MS thesis indicate that the ancestral lake Gosiute existed perhaps 3-4 million years earlier, and may have been much longer-lived, than previously thought. These results will reshape our understanding of climatic influences on the lake and may shake up global climate models for the earliest Eocene. Brian Jicha joined the group in the fall and commenced an MS thesis project aimed at determining magmatic processes responsible for 250 ka to recent lavas in the Aleutian Island arc. This will lay groundwork for a study using