Professor Nita Sahai with students and staff after a Friday Weeks Lecture.

effect of bioceramic surfaces for apatite (bone and teeth) growth on prosthetic orthopedic and dental implants. I have expanded this research to include the effects of major cations Mg^{2+} and H^{+} present in blood from which apatite precipitates. Interestingly, the fundamental chemical reactions are very similar to authigenic apatite formation from sea-water in sediment pore-spaces during early diagenesis. In collaboration with Dr. Melvin Glimcher and Dr. Jerry Ackerman at Harvard Medical School, another project involves experimental measurement and theoretical calculation of ^{31}P NMR shifts for phosphorylated amino-acids bound to calcium. Such amino-acids are believed to be involved in the nucleation of apatite on protein surfaces in the vertebrate body. The calculations will help identify the reactions involved in the very first stages of bone-growth, and could lead to development of drugs for treatment of osteoporosis, rickets, osteomalacia, etc.

In my four semesters at this department I have taught the following courses: Introductory Geochemistry, Crystal Chemistry, Fluids and Sedimentary Processes, Geochemistry of the Mineral/Water Interface, Biominerals, Environmental Geochemistry. Thus, in addition to courses relating to my research, I have taught courses that are somewhat outside my areas of expertise. I have served the department's needs, while trying to keep alive the needs of my research group. Developing six courses without repeating a single one in such a short time (four semesters) has taken a lot of time and energy.

Since starting at our department in fall 2000, it has been a period of adjustment to my new roles as faculty, advisor, teacher and resident in the Midwest. So I can honestly say that I have grown a lot in the past two years. In the past year, I have continued the learning process of how to advise students, how to tailor classes based on feedback from undergraduate students, and how to grow with the department through service on committees and through discussions with colleagues. I am glad to belong to a department where the opinions of untenured faculty are taken seriously and where we are given the chance to affect the course the department takes by serving on committees. One of the more gratifying jobs I have is Undergraduate Student Adviser, where I can interact with geology majors students. I was also invited to present my research work and teaching philosophy at Conferences of Societies that I would not ordinarily have thought of attending. I thus had many opportunities to meet with diverse researchers and educators with whom I was able to exchange ideas and develop new ways of thinking.

On a more personal note, being in Madison and the Midwest made me realize for the first time in my twelve years in America that I am a "minority". It was an uncomfortable realization. To deal with this, I have been participating in a year-long seminar course called Seeking Educational Equity and Diversity (SEED). This seminar has been very useful to me in exploring the ways in which we discriminate against different minorities, consciously and unconsciously. Also, ways to deal with such behavior and active steps to bring about change are discussed in the seminar. So, the past year has provided lots of opportunities for professional and personal growth.

❖ Toni Simo

"Between two worlds," summarizes 2001 very well for me. A special arrangement allowed me to split my time in equal proportions between Barcelona and Madison. Approximately every one and a half month I translated myself and office to one of the two locations. In Spain, I enjoyed staying with my family and the challenge of teaching and doing research in an engineering department. The host university was the Universitat Politecnica de Catalunya (the Spanish MIT) and I worked with engineers modeling and applying statistics to sedimentary successions. It is fair to say that we are still finding a common language (from equations to arm waving), but participating in classes has been excellent in setting the starting positions. I will continue collaborating with them in the near future integrating geoarcheology and modeling of sedimentary processes to reconstruct 3D sedimentary packages. In Madison I truly enjoyed the company of a great group of graduate (Norlene Emerson, Liz Leslie, Leonardo Piccoli, Kate McColgin, Essam Sharaf, Nancy Slatter, Michelle Stoklosa, and Blair Tormey) and undergraduate students (Jana Van Alstine), postdoc (Olga Rey), and colleagues.

As always the carbonate research group is spread throughout the geologic time scale and in five continents.

Close to home we are working the Ordovician paleontology, stratigraphy and K-bentonite correlation and age dating. Norlene Emerson, Liz Leslie and Blair Tormey in collaboration with Brad Singer (Rare Gas Geochronology Lab) and John Fournelle (Electron Microprobe Lab) have been able to fingerprint the chemistry in the apatites found in the Ordovician ash beds and change the traditional stratigraphic correlations.
$^{40}Ar/^{39}Ar$ geochronology of sanidine crystals in the same ash beds is giving a much older age for these strata. The integrated approach has changed the way we view the oceanography of an ancient continental epeiric sea.

The Wolfcampian (Lower Permian) of West Texas is Leo Piccoli's PhD topic. His work integrates sedimentology, stratigraphy, petrography, and forward-model seismic to determine the spatial variability of facies, internal architecture of sequences, nature of bounding discontinuities, and seismic features of carbonate platforms developed during the Wolfcampian. He is collaborating with Nik Christensen measuring velocities and densities of the rock succession. An interesting side of his work is the abundance of resedimented carbonates in the basin. His detail correlation seem to indicate that these basinal restricted wedges of allochthonous carbonates are the result of the collapse of highstand platforms and the product of platforms that grew downslope detached from the highstand platform.

The Cretaceous La Luna Formation of Venezuela was Olga Rey's project while in Madison. Her work has demonstrated a temporal general trend of increase in oxygenation at the sea floor associated with smaller frequency cycles that control the variations in terrigenous dilution and carbonate productivity. These cycles are probably due to obliquity. We are continuing our collaboration in the Cretaceous of Venezuela.

The Oligocene and Neogene is probably the more diverse of all the different projects; Kate McColgin, Michelle Stoklosa and Jana Van Alstine are working the Oligocene and Miocene of SE Spain, Essam Sharaf in collaboration with Martin Shields (A. Carroll) are studying the Oligo-Pleistocene of eastern Java, and Nancy Slatter studied (completed her MS degree) the Pleistocene of southern Australia. Cenozoic carbonate platforms are widespread and have many types of morphologies. The variability is in part because they form attached to growing structures, such anticlines and faulted uplifted blocks, during the closure of the Tethys. The students are investigating platform morphologies and facies to infer depositional processes, tectonic influence, and past climate and oceanography.

❖ Brad Singer

Last year was extraordinarily busy with several major projects underway and 13 abstracts presented at meetings in 2001. **Monica Relle** finished her MS thesis in May, won an outstanding presentation award at Spring AGU, and we have a paper in press in *JGR-Solid Earth* that establishes new temporal constraints on the behavior of the geomagnetic field during the last 820 ka. We coined the term Geomagnetic Instability Timescale (GITS) as yet further surprises in the palomagnetic record were encountered. I visited the remote Ascension Island—100 km from the mid-Atlantic ridge—for two weeks in June as part of my geomagnetic project to examine field behavior over the past 5 m.y. During his month-long visit to Madison last summer, former PhD student **Fidel Costa** and I completed a paper on the origin of compositionally zoned magma erupted at Volcan San Pedro, Chilean Andes. **Mike Smith** defended his MS thesis in December and we have a paper with **Alan Carroll** nearly ready to submit indicating that the ancestral lake Gosiute existed 3-4 million years earlier, and was much longer-lived, than previously thought. These geochronologic results will reshape our understanding of climatic influences on the lake and move the Green River Formation to the forefront of terrestrial archives of early Tertiary climate and tectonics. While investigating the timing of Aleutian arc magmatic processes for his MS thesis, **Brian Jicha** collected some exciting new $^{40}Ar/^{39}Ar$ dates from many Aleutian island arc lavas—some as young as 30 ka are the youngest and most difficult materials that we have dated in the Rare Gas Geochronology Lab (for a summary of lab activities go to: **http// www.geology.wisc.edu/~raregas**). Brian continues also to help lead our effort to establish U-Th isotope disequilibrium methods in the Radiogenic Isotope Lab together with **Clark Johnson** and **Brian Beard.** PhD student **Danny Douglass,** Weeks Post-doc **Mike Kaplan** and I traveled to Patagonia twice in 2001 to undertake mapping and sampling of the spectacular moraine sequence at Lago Buenos Aires. Two papers, nearly completed, that use geologic mapping and $^{40}Ar/^{39}Ar$ and cosmogenic ^{10}Be and ^{26}Al dating now constrain the glacial history in the southern Andes between 1.01 Ma and 15 ka. Two new students, **Miriam Barquero-Molina** from Oveido Spain, and **Melissa Harper** from the University of Maine joined the research group in September. Miriam's PhD focuses on Caribbean silicic Large Igneous Provinces of the Eocene and Miocene. In October, Miriam and I visited our collaborator Haraldur Sigurdsson at the University of Rhode Island to obtain archived samples from ODP cores and Central America for geochronology. Melissa is paralleling **Brian Jicha**