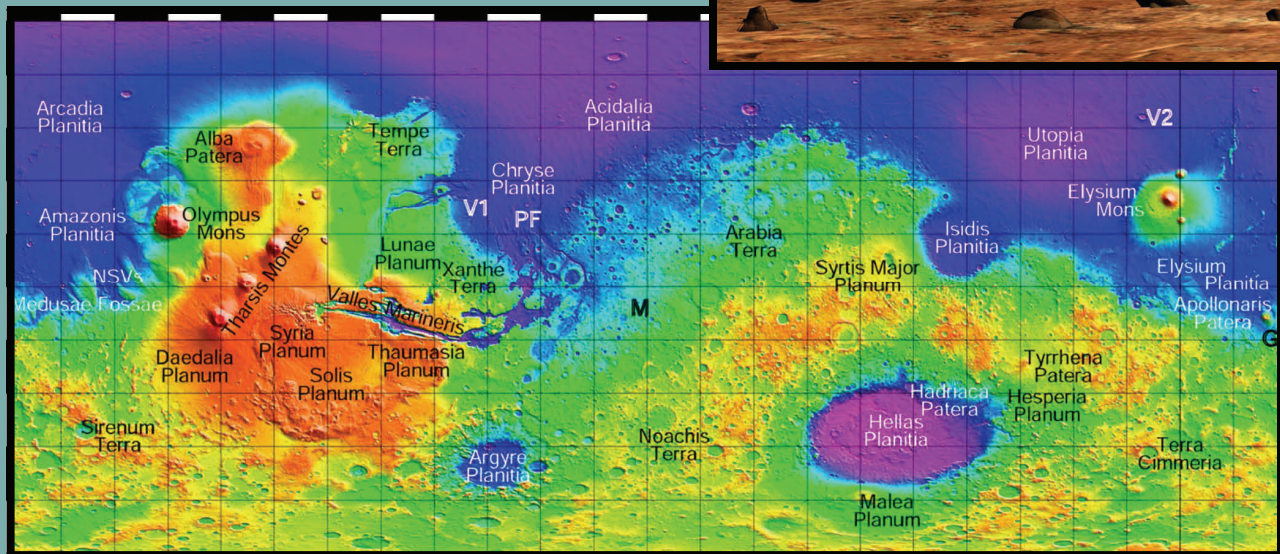
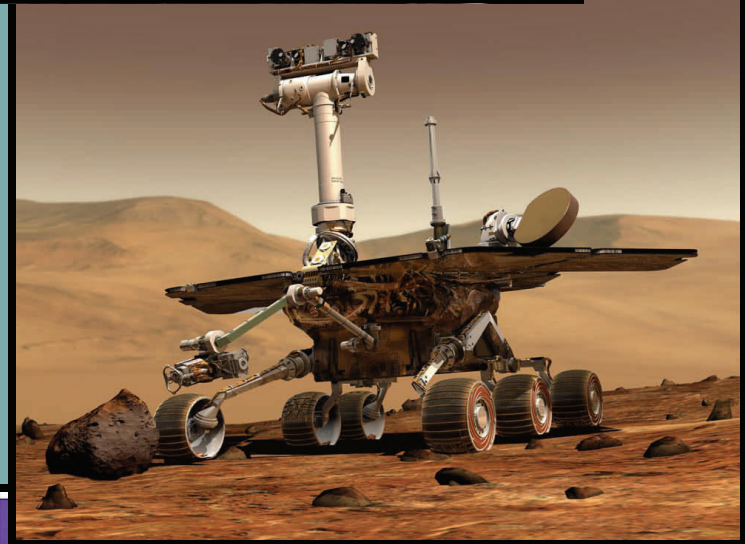


# Stony Brook University



## Department of Geosciences



2009 Year in Review

## Letter from the Chair

The past year has been punctuated by budgetary worries for almost everyone, and Stony Brook has been no exception. Although we're not out of the woods completely, I am happy to say that the Geosciences Department has fared very well. I attribute this to the strength of our research and teaching programs, and, of course, the people who make them so successful. We have consistently been one of the strongest departments on the Stony Brook campus, and all of our faculty maintain external funding for research and graduate training. Among several major grants received by faculty this year, one in particular stands out. Gil Hanson and his colleagues received a major NSF award to develop approaches to enhance diversity in the geosciences. A long-time interest of Gil's, this five-year project will focus on teacher and student training programs that should stimulate enthusiasm for careers in Earth science. Other major awards are providing so much new instrumentation that we are struggling to find space for it all.

Several of our faculty remain closely involved in instrument design and planning for the National Synchrotron Light Source II, which will replace its now aging predecessor at nearby Brookhaven National Laboratory. Along with many others in our Department, I am looking forward to this new X-ray facility, which promises greater opportunities for research in geochemistry and mineral physics. Faculty member John Parise has been appointed Co-Director of the Joint Photon Science Institute, which is a partnership between New York State and the Department of Energy, and spearheaded jointly by Brookhaven National Laboratory and Stony Brook University. JPSI's function is to provide leadership and initiatives that take advantage of synchrotron and other facilities to enable research throughout the region. In addition to John's leadership role in this community, he was also selected to receive a 2009 Fulbright Distinguished Scholar Award for his research innovation.

In other faculty news... Deanne Rogers has been awarded a NASA Early Career Fellowship. Teng-fong Wong has been selected to receive the Louis Néel Medal of the European Geosciences Union. Bob Liebermann is just completing his second term as President of COMPRES, the NSF-funded consortium for high pressure, mineral physics research. He will remain as past-President to facilitate the transition to incoming President Prof. Jay Bass of the U. of Illinois. Many of you will know that Jay received his PhD from Stony Brook in 1982. After serving for three years as Interim Dean of Stony Brook Southampton, faculty member Martin Schoonen returned full time to Geosciences. Martin oversaw the creation of the new satellite campus and development of its curriculum, especially the coastal environmental studies program. We also welcomed Southampton faculty member Michael Sperazza as an affiliated Assistant Professor in our Department. Michael's research brings together paleoclimate, sedimentology, and paleoanthropology, and promises to offer new research directions for us.

This is our second annual newsletter after a long hiatus. The responses that I received following last year's newsletter

were overwhelmingly positive. Many of you were especially interested in Emeritus Professor Bob Dodd's history of the Department. You will be pleased to read Bob's next chapter which begins on the following page, and we can all look forward to future installments from him chronicling our past. Following last year's newsletter, I was also delighted at the response from alumni in supporting the Department through donations. We have been very fortunate to have some major gifts, most notably those from David E. King (MS '84) and Vesna Kundic (MS '05). Yet every contribution is special for us. In this year's newsletter you will also learn about our newest faculty member, Prof. Artem Oganov. He has brought a major focus in computational approaches to the Department, and his research has inspired new ideas in earth and planetary sciences, mineral physics, and other disciplines.



There is also great anticipation in Geosciences, with the news that a major project is underway to re-landscape the entire courtyard facing the ESS building. Many of you will remember the occasions when the courtyard flooded following heavy rains, much to the delight of the local ducks. The new landscaping of the courtyard and adjacent walkways will embrace an environmental theme, including the use of several rock types that should lend themselves to introductory teaching labs.

There are some new faces in our Department's front office. We were especially fortunate to have Gabrielle Tobin assume the Assistant to the Chair position, which had been open for nearly a year. Gabrielle was previously the Director of the Honors College at Stony Brook, and she brings us a wealth of knowledge about student matters. The retirement of long-time graduate secretary Loretta Budd created a vacancy, which was filled by Yvonne Barbour. Loretta will be greatly missed but we are indeed fortunate to have Yvonne taking over this very important position. Staff Assistant Diane Isgro and Director of Labs Owen Evans complete the front office staffing, which, along with our machine and electronics shops, continues to provide students and faculty with essential support and guidance.

For my part, I find that balancing the duties of Department Chair with my research and teaching is a welcome challenge. Although my research has long been lab-oriented, I've found some renewed interest in field topics. This has been fueled in part by a recent trip to Kenya, accompanying faculty members Troy Rasbury, Michael Sperazza and several colleagues in the School of Marine and Atmospheric Sciences, to survey some of the sedimentary deposits near Lake Turkana, where early Hominid remains have been found. The most gratifying aspect of being Department Chair is certainly the opportunity to hear from former students; so, I hope that all of you will take a moment this next year to contact us.

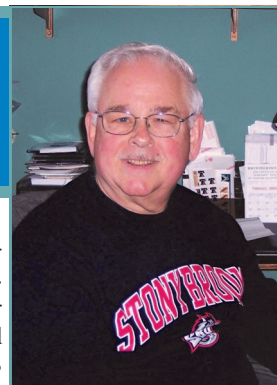
*Rich Reeder*

[rjreeder@stonybrook.edu](mailto:rjreeder@stonybrook.edu)



## Starting ESS: II. Year One (1965-66)

Robert T. Dodd (Professor Emeritus)



Robert T. Dodd

### Washington, D.C., April, 1965

For months since he hired me, Oliver Schaeffer had been dropping hints that he was trying to recruit a very well-known senior geologist to give Earth and Space Sciences an instant reputation. He had refused to identify the quarry for fear of scaring it off, but when we met at the annual meeting of the American Geophysical Union, he gave me the news: Sam Goldich, a legendary geochemist with a mile-long bibliography, had agreed to join the ESS faculty. “Wow!” I exclaimed. “S.S. Goldich! Can I tell people?” “Go ahead,” Ollie replied.

Excited, I hurried off to tell friends about Ollie’s big catch. Expecting congratulations, I was disappointed. “Oh my God!” said one man, then walked away, shaking his head. “You’d better leave Stony Brook right now!” said another, who was in Sam’s area of geochemistry but clearly no fan. “No, wait,” he added. “On second thought, there’s no need to leave. Sam never stays in one place for long!”

It was a tiny, unscientific poll, but it shook me. When I spotted Ollie again, I hailed him. “I think there’s something you should know about Sam...” I said. He laughed merrily. (I would learn that this was his standard response to bad news.) “Oh I know that!” he said. “I hired him for other reasons!” I had to trust that Ollie knew what he was doing, but I found other things to talk about for the rest of the meeting.

Born in 1909, Sam Goldich was 74 when he came to Stony Brook, and he would stay for just three years before moving on to Northern Illinois University. Our first meeting, at AGU, suggested that working with him would be challenging. “What kind of microprobe are you using?” Sam asked. “A Philips prototype,” I replied. (It was, in fact, *the* Philips prototype, designed by two friends at M.I.T.) “That’s a piece of junk!” Sam exclaimed. End of discussion.

### With a little help from our friends

In its earliest years, Stony Brook was so small that I could recognize most other faculty members by sight and got to know many of them personally. A Senate meeting was like old home week, and the school had a strong sense of community: a willingness to help each other across disciplinary lines, which would suffer later as the university grew larger and money became tighter.

Between 1965 and 1969, Ollie, Sam, and I were billeted in Old Physics (now Harriman), one of us per floor. I taught my first freshman geology class in PHY 115 and was startled, 22 years later, when I took a philosophy class there during an international studies program run by the Federated Learning Communities.

As we shall see in a later article in this series, most of our department’s research in 1965-66 took place off campus. Schaeffer continued his work at Brookhaven. Although many of his co-workers — Fred Gwinner, Bill

Huebsch, Ted Ludkewicz, and Bob Muller among them — would soon migrate northwest to the University, only Fred, our long time shop chief, and perhaps Ted were there in 1965 and were thus ESS “originals.” Our first undergraduate students, about whom I’ll say more elsewhere, drifted in from other departments, attracted by Ollie’s gentle introductions to geology and astronomy and/or put off by the sterner demands of physics or chemistry. For practical purposes, our graduate program kicked off in the fall of 1966. Even then, one eager Physics student — Bob Warasila — delayed his switch to ESS until he and Ollie were sure our program would be approved.

The Physics faculty made our small band welcome, and many of them — Cliff Swartz, Lin Lee, Tony Bastin, and Max Dresden spring to mind — became good friends. We shared seminars and parties with them and felt their pain when one of their number shot himself by the bull in Smithtown. Until Oliver hired our first secretary, the warm-hearted, endlessly helpful Della Sconyers, the Physics secretaries, Mrs. Rhame and Mrs. Kahn, served as our ESS god-

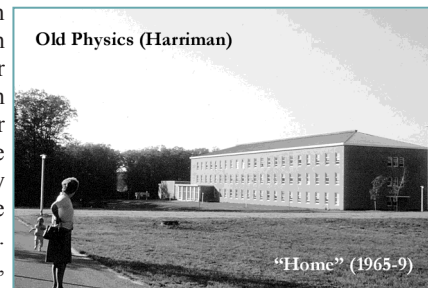
mothers. Almost everyone in Physics treated us like kinfolk. The only exception was a mathematics professor who had charge of the tiny Physics-Math library. She resented every misplaced book and bridled when I requested a second shelf for ESS. Although she seemed to like me even less than I liked her, I suspect that she was just the first person in the building who recognized that ESS was viral: We would grow, and quickly.

The good feelings that we experienced as newcomers went beyond Physics. In those days, the number of teaching assistantships given to a department each year was based strictly on its graduate enrollment. Although ESS had no students in 1965, Ollie persuaded the Graduate School to give us one assistantship *gratis* so we could recruit students for 1966. This freebie survived well beyond the justification for it. I remember asking Dean Herbert Weisinger for it a few years later, when I was the department’s Graduate Program Director. His response — “Go to hell!” — told me that ESS had graduated: We were no longer the new kids on the block!

### A (Small) Band of Rivals

Many years ago, *Newsday* ran an article that excoriated Stony Brook professors for spending too few hours of each week in the classroom. I wrote, and the paper published, a response in which I pointed out that classroom teaching is the least time-consuming of faculty responsibilities, which also include research, reading the professional literature, writing papers and books, advising students, hustling for grants, interviewing prospective students, and attending meetings.

Old Physics (Harriman)

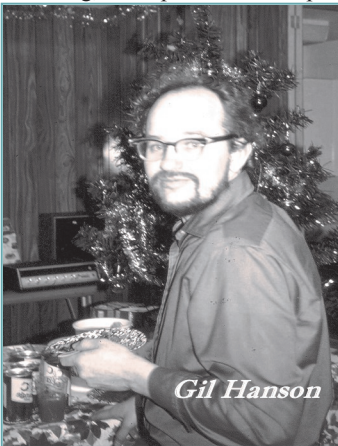


“Home” (1965-9)

## Starting ESS: II. Year One (1965-66)

In 1965, Ollie, Sam, and I had all of these obligations plus others that were innate to a new and ambitious department. We had to design and equip courses; outline and defend graduate programs; and — most time consuming of all — recruit more faculty colleagues. “Busy” doesn’t begin to describe our first year as Earth and Space Sciences.

That year was also tense, for Sam and Ollie were, in disposition and tactics, as different as two people can be within the boundaries of *Homo sapiens*. As I had learned at AGU, Sam’s quirks were well known to the geological fraternity. In an obituary that he wrote after Goldich died in 2000, Bruce Doe wrote, “No discussion of Sam would be complete without some mention of his famous personality.”<sup>1</sup> As Doe reports<sup>1</sup> and I can confirm, Sam was “prone to giving unsolicited good advice or opinions,” often “in a tone that the recipient would take as criticism or, even, condemnation.” One Stony Brook colleague called him “a sugar coated pill turned inside out.” Another, paleontologist Ray Smith, said, “When Sam gets up in the morning, he steps into bear traps instead of slippers.”



Doe’s obituary contains clues to Sam’s behavior that I would have found comforting had I known of them in 1965. One is that he was bedeviled by allergies. Doe describes a class where Sam asked the same question over and over, becoming louder and angrier as every student failed to answer and punctuating the inquisition with bouts of nose blowing. “He finally said with a cute smile, ‘This class sure is stupid when I don’t feel good.’” Having watched Sam push many a point to rage, then grin and back away, I recognized the pattern. I also understood why when he, Gil Hanson, and I taught sections of the same course one semester, the students rated Sam last by a wide margin. Warm and fuzzy he was not!

Doe observes that Sam only abused students and colleagues whom he respected and dealt gently with those whom he judged to have limited potential. When I passed this insight on to Elliott Golub (Class of ‘68) who had worked with Sam in Northern Ontario in 1966, he found it flattering. Elliott described that summer job as “a high point in my life,” but

<sup>1</sup> Doe’s obituary and links to other information about Sam’s extraordinary career can be found on a memorial website ([www.geo.sunysb/ssgoldich/](http://www.geo.sunysb/ssgoldich/)) constructed and maintained by Gil Hanson.

that had more to do with the unusual opportunity to do research (“Me! An undergraduate!”) than with Sam’s disposition, which he described, with kind understatement, as “grumpy.”

I wish I had known that Sam only abused colleagues and students whom he respected. I always felt that he undervalued me, even when he let me drive him to Princeton in his brand new, powder blue Thunderbird. Afraid I’d scratch the car or a bird would bomb it, I was tense throughout the trip. Elliott Golub, who had driven the T-bird in Ontario, recognized the feeling when I told him about it last fall. He laughed when I said I recalled the Princeton trip recently while I was watching an old movie. It was *Driving Miss Daisy*.

Sam and I had a complex relationship in which my role varied, often hour by hour, from favorite (but none too bright) son to field hand and his swung between smothering parent and drill sergeant. He could go from good natured to ballistic in an instant, often for no obvious reason. I learned to spot the color rising on his bald head and make haste for the door, but I was not always fast enough. When Sam chased me out of his office one day, I ran, fuming, to Ollie. His response, delivered as always with twinkling eyes and a broad grin, was “Really? He kicked *me* out an hour ago, and I’m the *Chairman!*”

I usually leaned toward Oliver’s view on controversial issues, of which there were many: A common result of long, tense deliberations was “two votes in favor and a letter to the Dean.” But Schaeffer knew that I felt vulnerable trying to steer a course between two full professors. When I complained about this one day, he said, “You just agree with Sam. I can take care of myself.” Startled by a flash of ego from an unusual source, I said, albeit with a grin, “It may surprise you, but it’s not always hard to agree with Sam!” It was the only time in my 15 years with Schaeffer that I saw him nonplussed.

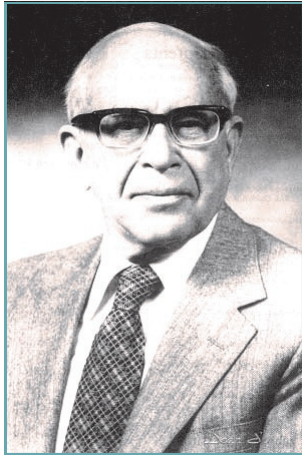
As mercurial as Sam was, he could be charming in the right circumstances. My wife, Marya, liked him because, a bachelor, he would talk to her about drapes and carpets while the rest of my colleagues nattered on about rocks or stars. At our house for dinner one evening, Sam strolled through room after room, admiring my great grandfather’s paintings and our old furniture. Then, spying some bits of colored glassware in our bay window, he pronounced sentence: “That’s junk!” When I groused about this later, Marya said, “He’s right, dear. It *is* junk!”

Accustomed to taking flak from Sam on matters large and small, I came to expect it. Thus, when Gil Hanson told me in 1969 that he had called my long review paper on metamorphism in chondrites “pretty good for him,” I bristled. “You don’t understand,” Gil said. “From Sam, that’s high praise!”

## Starting ESS: II. Year One (1965-66)

The incident reminded me to keep my thin skin out of the sun.<sup>2</sup>

Gil and I have different takes on why Sam left Stony Brook after just three years. He thinks Schaeffer got what he needed from Sam, then edged him out. I think Sam knew that he would be out shouted by the bright, young hard rock geologists who would soon join the ESS faculty. I think he just wanted to move on to a place where he could, once again, make a difference. Either way, I share Gil's view that if Sam had stayed longer he would have continued to be "a thorn in everyone's side."



Sam Goldich

Sam's stormy relationship to ESS continued to his last days in ESS. Gil recalls that "we had a going away lunch for him at the Three Village Inn. We had the students ask Sam to attend, but [he] still refused. We went to the 3VI to have lunch anyway."

Gil remembers Pete Palmer remarking that the bon voyage party was probably more fun without the guest of honor.

Sam's brief tenure at Stony Brook added little to his resume', but he played an important role in the early history of Earth and Space Sciences. Pete Palmer and Gil Hanson, both of whom would chair ESS with distinction, would not have come to Stony Brook without Sam's efforts. He was also instrumental in negotiating the four man "package" (Ted Bence, Don Lindsley, Jim Papike, and Charlie Prewitt) that would arrive in 1969 and make Stony Brook a power in mineralogy and petrology. Hard to live with, Sam would have been harder for ESS to live without. When he finally retired from teaching, he moved to Colorado, where Pete Palmer stayed in touch with him. "He was always fun to have lunch with," Pete recalls, "if one didn't let his crotchiness get in the way, and he was a very generous person."

Oliver Schaeffer was night and day different from Sam, as consistently warm and unassuming as Sam was outspoken and mercurial. Although some of Ollie's good nature was put on ("You can't always tell from the outside what's going on inside," he said through a grin after a shoot-out with Sam), I attribute most of it to his Quaker upbringing. Shrewd he was, but also gentle and kind. It is no accident that there were many tears at his funeral in 1980. Quite a few of them were mine.

By 1965, Schaeffer had planned what would become the ESS building, but many details remained to be worked out and Sam bucked him at every step. I recall a wearying evening of argument over whether lab benches should be topped with soapstone or a composite. ("Both" seemed to be ignored as an option.) Ollie, who favored soapstone, was quietly determined that it was best. Sam was just...well...determined.



Oliver Schaeffer (right) with postdoc John Funkhouser

Oliver was at his tactical best when he recruited Allison ("Pete") Palmer for Stony Brook. Pete, an experienced paleontologist, was working with the U.S. Geological Survey in early 1966 when Goldich, an old Survey friend, appeared in his office at the U.S. National Museum. "He didn't beat around the bush," Pete recalls, but asked if he would like to come to Stony Brook. Pete asked Sam what and where that was. When Long Island was mentioned, he ended the discussion with "No way." Sam left, for once without argument.

A week later, Ollie Schaeffer showed up in Pete's office. "He didn't push," Pete says, "but explained that neither he nor Sam had any experience in soft-rock geology and would I just come to Long Island (all expenses paid) to review the applications of some [junior] candidates?" That visit seemed innocent enough, but it happened to include informal talks with some of Stony Brook's top brass and a request to return to interview three prime candidates. "When you come back, bring your wife," Ollie said, putting extra cheese in the trap. A stay in Sunwood added still more and led to Pete's decision – and wife Pat's – to move to Stony Brook. Pete notes that having participated in the first act of this drama, Sam brought down the curtain by telling him he was nuts to take the job!

Schaeffer carried a Quaker preference for friendly persuasion and consensus into faculty meetings. If an idea or proposal was acceptable to all hands, he'd call for a vote. If one or two people objected, he'd say, "We don't need to decide this right now." I learned to expect a visit within the hour if I had been a dissenter. Ollie would appear in my office, pull up a chair on the other side of my desk, fold his hands in his lap and ask, grinning, "How ya doin'?"

Ollie was not above using his small stature and obvious physical handicap to his — and our — advantage. When a noisy student protest erupted in the ESS courtyard in 1968, he insisted on going out to talk to the protestors. "They won't hurt a little guy," he explained, and they didn't. I noticed too that when he crossed the campus to ask something of the Administration, he seemed to get smaller with every step. He rarely came back empty handed.

<sup>2</sup>Sam spooked me enough to make me explore alternatives to a career at Stony Brook. A recruiting visit to Arizona State, where I had and still have good friends, took a comic turn when one of ESS's top faculty candidates, Dave Waldbaum, showed up to interview for a position in Chemistry. Perhaps unkindly, I startled him by sitting in the front row at his seminar. Unaware that I was being recruited for Geology at the same time, Dave said to me after his talk, "Boy, you guys really cover your candidates!"



## Starting ESS: II. Year One (1965-66)

Pete Palmer describes Schaeffer as a “consummate snake oil salesman,” but he says it with affection. I once told a younger professor, in Ollie’s presence, that I never went to his office without buttoning my wallet pocket. “Why do you say that?” Ollie asked. “Because it’s true!” I replied. We all laughed, Ollie the loudest.



Pete Palmer

In his later years, colleagues accused Schaeffer of filling ESS’s 257-seat lecture hall by handing out cheap A’s in his freshman courses. The charge is not entirely unfair — His explanation of a particularly glaring example had the smell of a non-denial denial — but it overlooks Ollie’s real talent for making complex material interesting and accessible.

Bill Huebsch, who has been ESS’s (and now GEO’s) electronics chief since 1969, made this point to me in a recent phone call. Ollie could explain anything to anybody,” Bill said, “whatever his or her background.” I would only add that he was always willing to do so. Oliver Schaeffer was a gentleman, in the original and best sense.

### Growing ESS

Recruiting more faculty took much of our time in 1965-66, for we hoped to both add strength in geology and start to populate one or more of the other fields — astronomy, oceanography, and meteorology — that were to share our new building. Rarely did we entertain fewer than two candidates per week and, more than once, one visitor was leaving through the back door of the Physics building even as another was entering the front. Faculty from other departments and Ollie’s colleagues

from Brookhaven pitched in to provide what would otherwise have been skimpy audiences, but it fell to Ollie, Sam, and me to squire candidates around the campus and see to their care and feeding.

The recruitment process gave me a remarkably broad scientific education. Before 1965, I had no idea that stars come in brown or that where sedimentary rocks contain big and little fossil trilobites, the little ones commonly lack tails — a relationship with macabre implications. But the cost of frequent meals out was daunting for someone on an assistant professor’s salary (No more Chef Boy-ar-Dee!). I soon learned that although Schaeffer was in a much higher pay grade than I, he had a sharp eye for the bottom line. When he ordered something expensive, he’d suggest, “Let’s just split the bill.” When he ate little, he’d ask, “What do I owe?”

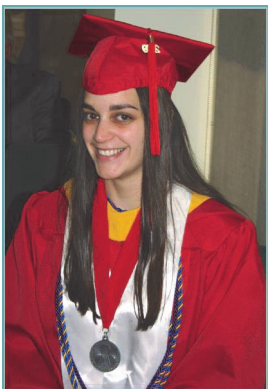
It was fortunate for our wallets that, as Gil Hanson reminds me, the cafeteria in the G and H dorms offered faculty members and guests all they could eat for lunch for a dollar. It was one of the lesser bennies that Stony Brook used to attract professors who might otherwise have gone to a better known school. Like most good things, it didn’t last.

Sam Goldich attended every seminar. Unless the speaker’s topic interested him, and sometimes even if it did, he would nod off as soon as the lights went out. Then he would pop to when they went on, with his hand up to ask a penetrating question. It’s a gift, I guess. I only mastered the first part of it.

Our year of hosting visitors paid off handsomely. In the fall of 1966, ESS added four new professors: A senior and a junior paleontologist (Pete Palmer and Ray Smith), an isotope geochemist (Gil Hanson), and an oceanographer (Peter Weyl). As our new building began to rise from a clearing next to Physics, it appeared that we would have bodies to fill it.

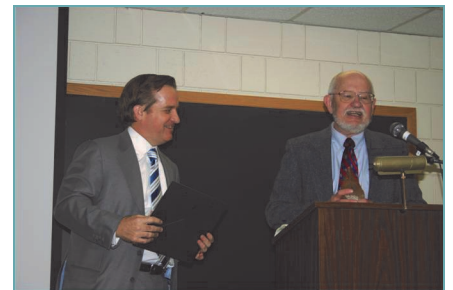
ESS was on its way!

## Graduation Highlights, May 2009



Oliver Schaeffer  
Award recipient  
Janette Wilson

The Departmental Graduation Ceremony has become a very popular event for graduates, family, and friends.



David E. King (MS '84, left) accepts  
Distinguished Alumni Award from  
Prof. Gilbert Hanson.

# Apollo 11 40th Anniversary

## Reminisces from Richard Hurst (BS '70)

In the year that marks the 40<sup>th</sup> anniversary of Apollo 11, I wish to provide you with a brief "walk backwards" to 1969 when I worked for Professor Oliver Schaeffer, conducting research on the U/Th dating of corals and the Apollo 11 lunar samples (performing rare/noble gas analyses). I had switched from a major in mathematics after my sophomore year, having taken an intro geology class from Professor Robert Dodd during the spring semester. I did this despite the fact I could have finished the math major during my junior year. At that time, 1968-69, a career in oceanography was purported to be the field of the future. My department advisor was Prof. Peter K. Weyl.

Call it fate or whatever, but during my Junior year the marine science faculty broke off and for whatever reason [that students were not privy to], dropped all their advisees. So there I was, orphaned from my future career or so I thought. All of a sudden, there was this chatter about going to the moon to return samples and beat the Soviets. Looking to help support myself, I approached the Department Chair, Prof. Oliver Schaeffer, about work in the Department of Earth and Space Sciences. I figured there must be some money about for students, given the nice new building, grants from the Atomic Energy Commission (AEC), and the fact some of my friends worked for other faculty (Profs. Dodd, Hanson, Bence, Papike, and Prewitt).

Well, Dr. Schaeffer hired me to work, initially, on U/Th dating of corals, which became a Senior Research Paper. However, by the spring of 1969 I left the tutelage of Willard S. Moore and Karen Karlstrom, who worked for Dr. Schaeffer doing marine geochemistry, moving to the lab one door down where Jerry Barber, Bob Warasila, and John Funkhouser worked on rare/noble gas analyses. Work was under way to prepare for the lunar sample return. I will not go into the great educational and occasional

(well, maybe more than occasional) humor that went on in that lab, but I really learned a great deal from all involved and was always supported by Dr. Schaeffer, financially and professionally.

When the Apollo astronauts landed on the lunar surface, we (Bob Dodd, Ted Bence, Jim Papike, and I) watched the landing and ultimate return on a TV hooked up in Ted Bence's office. It was quite humorous when the lunar lander took off, and despite the total intelligence present in that room, everyone was caught off guard when the lunar lander raced off the screen to rejoin the lunar orbiter. Somehow, we all had momentarily forgotten about the gravitational disparity between the Earth and our Moon — we got a good laugh.

Well, samples finally arrived, and I recall lead bricks around the mass spec sample port so the lunar samples irradiated for Ar/Ar dating could be analyzed rapidly even though they might have been a little bit "hot", so to speak. The mineralogists, Drs. Bence, Papike, and Prewitt, were merrily probing the life out of lunar samples and looking for new minerals. God, it was fun.

Finally, on a closing note, I remember an open house in the Department where a lunar basalt was displayed in a glass case about the size of a shoe box. Standing there talking to Dr. Schaeffer, I asked what would prevent someone from grabbing the display case and taking off. Well, in his own inimitable way Dr. Schaeffer said they had about 75 pounds of lead weight attached—he then said, and I quote given I have never forgotten his words, "If someone can pick that up and run with it, maybe we don't want to catch him!"

So, those days are etched in my memory and I remain grateful to those who guided my path during those years.

Richard Hurst, PhD  
Prof. Emeritus Geology and Geochemistry  
California State University, Los Angeles



Credit: NASA

## Technology and Innovation Make Geo Field Course a Hit



GEO 305, *Field Geology*, has evolved over the years to give our undergraduate majors an exceptional range of experience in both classical and high-tech modern methods. Instead of concentrating on a specific area within geology (such as structural geology or stratigraphy), GEO 305 has been designed to give students experience in making observations in the field and then analyzing and reporting their results, all using the latest technology. The driving force behind the innovation and the greater use of technology comes from Geosciences faculty Gil Hanson and Dan Davis with help from MPI staff member Glenn Richard, who contributes his expertise in computer-based methods such as GIS. The actual assignments cover a broad swath of the geosciences. They map distribution of glacial erratics, monitor groundwater levels, and carry out stratigraphic analysis of excavated and cored sediments in and around the Stony Brook campus. Students also use geophysical tools, such as ground-penetrating radar and resistivity, to augment their interpretations of the sediments. All their fieldwork is aided by the mapping skills they learn in the course, using field tools ranging from transits and laser levels to GPS and computer-based tools such as Google Earth and GIS. Above all, the students learn to prepare high-quality reports, a skill they find particularly valuable when they go on to graduate school or work in industry.





## Geoscience Faculty In Residence



**Daniel Davis, Professor**  
Geophysics, tectonics, analog modeling.



**Timothy Glotch, Assistant Professor**  
Planetary geology, remote sensing,  
Martian surface mineralogy.



**Gilbert Hanson, Distinguished Service Professor**  
Environmental geochemistry, geology  
and hydrology of Long Island.



**William Holt, Professor**  
Tectonophysics



**Robert Liebermann, Distinguished Service Professor**  
Mineral physics, solid earth geophysics.



**Donald Lindsley, Professor Emeritus**  
Geochemistry, petrology.



**Scott McLennan, Professor**  
Geochemistry, crustal evolution,  
sedimentary petrology.



**Hanna Nekvasil, Professor**  
Experimental mineral/melt equilibria,  
planetary petrology.



**Artem Oganov, Professor**  
Computational crystallography, high-  
pressure mineralogy, computational  
materials design.



**John Parise, Professor**  
Crystal structure-property relations, solid  
state synthesis.



**Brian Philips, Associate Professor**  
Mineralogy, low-temperature geochemistry.



**Troy Rasbury, Associate Professor**  
Sedimentary geology and geochemistry,  
geochronology.



**Richard Reeder, Professor and Chair**  
Geochemistry and mineralogy relating to  
near earth's surface processes.



**Deanne Rogers, Research Assistant Professor**  
Planetary geology, remote sensing.



**Martin Schoonen, Professor**  
Geochemistry of sulfur and sulfides,  
hydrogeochemistry, catalysis.



**Christiane Stidham, Lecturer**  
Crustal seismology and tectonics, natural  
hazards.



**Donald Weidner, Distinguished Professor**  
Mineral physics and the earth's deep  
interior.



**Lianxing Wen, Professor**  
Seismology, geodynamics, global  
geophysics and planetary sciences.



**Teng-fong Wong, Professor**  
Rock deformation and fluid flow, physical  
properties of geomaterials.

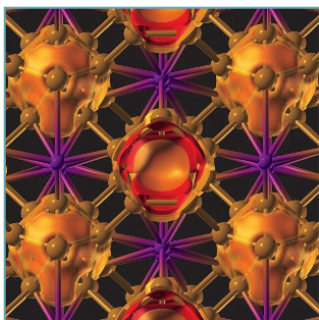


## Faculty Profile:

### *Artem R. Oganov Leads the Way in Computational Crystallography*

Greetings to Geoscience friends and alumni! I moved to Stony Brook in November 2008 and have found it to be a wonderful place to live and work. One day, when I have nothing better to do, I'll write a book of memoirs, but for now let me tell you my story and a bit about my research and teaching.

I was born in Moscow, Russia, in 1975. Our family is very large and diverse — among my relatives are engineers, artists, programmers, business people, doctors, lawyers, politicians, soldiers, teachers, musicians, pilots; they live in nine different countries and speak seven languages. Since the age of six I dreamed of becoming a chemist, and from the age of seven attended chemistry lectures at Polytechnic Museum and University of Chemical Technology.



Electronic structure of  $\gamma$  B<sub>28</sub>, a new phase of boron discovered at SBU

With time my interests evolved – first to mineralogy, then to physics. But I always knew that I would be a scientist. In 1997 I graduated from Moscow State University with an MSc degree in Crystallography, and, having obtained a Russian Presidential Scholarship for Education-Abroad and a British

Government Scholarship, I went to the U.K. I was fortunate to have Prof. David Price, a wise and inspiring person, as my supervisor. In early 2002 I obtained a PhD in Crystallography at University College London, and continued for 1 year as a postdoc. After that I took up a position of Senior Scientist at ETH Zurich, Switzerland. My mission was to organize a group in computational crystallography. This was a very successful experiment, and also great fun. In continental Europe there is a degree higher than PhD – it's called Habilitation. Mainly for fun, I obtained this degree in 2008. Later that year I came to Stony Brook. As it turned out, some of my relatives had also moved to Long Island. Not only Long Island, but also the Department has become a family-like environment.

Here in Stony Brook, I've built a computational crystallography and mineral physics laboratory. We work on a diverse range of problems, from developing new simulation methods to computational materials design and to high-pressure mineralogy and physics. My teaching, both on undergraduate and graduate levels, focuses on these topics.

I keep on adapting my teaching strategies, to maximize the effectiveness of learning. I enjoy teaching almost as much as I enjoy research. The central question of my research is how the structure of matter relates to its properties, and how to predict both. The keys to success of my lab are strict selection of students and postdocs, family-like atmosphere and a lot of fun and play at work. Science is not only hard work, it is also fun! Our “toys” are some of the world's biggest supercomputers in the US and in Russia.



Prof. Artem R. Oganov

Let me mention a few of my research projects. In 2001 I figured out how to accurately compute the elastic constants of crystals at high temperatures, and performed the first calculations of this kind. From these it emerged that there are very large temperature variations in the Earth's mantle, reaching some 2000 K in its lowest part. In 2004, in collaboration with S. Ono (Japan), I found an explanation of the complex and counterintuitive properties of the Earth's D'' layer, the lowermost part of the mantle. These properties are explained by a new silicate mineral, MgSiO<sub>3</sub> post-perovskite, that was found in our theoretical and experimental study, as well as in the simultaneous experiments done in Japan. Subsequently, in 2005 we discovered a similar phase of Al<sub>2</sub>O<sub>3</sub>. The same year, I proposed a mechanism of the phase transition leading to post-perovskite, and a mechanism of its plastic deformation in the mantle. In parallel, I worked with my graduate student Colin Glass, on solving the problem of crystal structure prediction. Widely believed to be insoluble, the problem of finding the most stable arrangement of atoms for a given chemical formula actually turned out to be amenable with the evolutionary algorithm that we have developed. The simulation code, initially written by Colin and later expanded by Andriy Lyakhov, is now used by almost a hundred researchers worldwide. Using this method, and in collaboration with many experimentalist and theoreticians (most notably, Yanming Ma, Vladimir Solozhenko, Mikhail Eremets, Jihua Chen), we made several exciting findings in the fields of high-pressure chemistry and physics. These included tetrahedral carbonate ions, a remarkable high-pressure superconductivity in GeH<sub>4</sub>, a transparent form of sodium, and a partially ionic allotrope of boron with a rocksalt-type structure. Very recently, my old friend Mario Valle (Switzerland) and I worked on a new language for chemistry – the language of energy landscapes. This transforms chemical concepts into multidimensional spaces, and during this study we had to learn about hyperdimensional geometry, data mining and lots of other interesting things. My principle is not to limit creativity by artificial boundaries, but to solve any important problems that I can, and to learn from research. There is a lot to be done in all the fields of science related to the structure and properties of materials. And it is a pleasure to pursue this research at Stony Brook.

## Alumni Focus: Joanne Fredrich (BS '85)

While completing her BS Honors degree in Geology at Stony Brook, Joanne conducted research with Professor Teng-fong Wong. She then went to MIT for graduate studies, receiving a PhD in Geophysics in 1990. After a brief postdoc at MIT, Joanne was a research scientist at TerraTek (now a Schlumberger company) for 3 years, then spent 13 years at Sandia National Laboratories where she ultimately held the position of Distinguished Member of the Technical Staff. She joined BP in 2006, where she is the Petrophysics - Rock Properties Advisor for BP's Subsurface & Wells function. In addition to her Advisor role, she leads a major R&D program in rock physics.

*We asked Joanne to share some of her experience with us. Here's what she had to say.*

**How did your experience as a Geosciences student at Stony Brook prepare you for your future?** It was at Stony Brook that I realized that geology frustrated me in being too qualitative and that geophysics was more interesting to me. It is also where I learned what research actually was and how to do it. I was extremely fortunate to be mentored by Teng-fong Wong.

**What piece of advice can you give to current students?** Expand your horizons. Don't stick to your comfort zone. The greatest scope for advancement is in the overlap between disciplines, so seek out the unconventional.

**What's your best memory of Stony Brook?** It was a welcoming environment and the professors were happy to have you arrive unannounced in their offices, seeking help. The grad students treated me like I was one of them, and it was a very supportive environment.

**Your worst?** I did not like the endlessly gray weather that could happen sometimes, especially in winter months. It has been great to see some more aesthetic buildings being put up over the last few years.

**What's your take on the key issue in the global warming debate?** Is there a debate? My opinion is that there is nothing to debate and that global warming is real. The issue is the quality of the science, and the political reality of accomplishing what is required. The challenge is also in the ability and willingness of the academic community to embrace alternate views, and to be part of the solution rather than part of the problem.

**How can the petroleum industry gain greater confidence and trust from the public?** I think that this is a matter of perspective. I live in Texas, and Texas loves the petroleum industry. There are many states in the US where oil industry revenues keep the economy going. That said, industry needs regulation — whether that be petroleum, mining, medical, or banking.

**What does the petroleum industry see as tomorrow's foremost challenge?** The US is the world's largest energy consumer per capita. The petroleum industry is key to maintaining our current lifestyle. It should be remembered that fifteen of the largest twenty oil companies in the world are state-owned. The international oil companies (supermajors) are therefore key to ensuring an independent supply of energy to the US. My company, together with the other supermajors, is continually advancing the technology required to discover and exploit resources on the frontiers, either geographically or technologically.

For example, in the deepwater Gulf of Mexico, BP drilled in the summer of 2009 the deepest oil and gas well ever drilled — to a depth of nearly 6 miles at a cost of almost one quarter of a billion dollars. It is really wonderful to have the opportunity to work within such an industry — where technology is key to delivering the bottom line.

**What do you consider the greatest challenge that the geosciences face today?** Funding and recognition. The reason why the biosciences have done very well is because nearly every person walking down the street believes in the hope of a miracle cure for cancer. In contrast, they are less convinced about a miracle solution for earthquake prediction, geothermal energy exploitation, levee construction, and mining and resource extraction. Our problems tend to have a longer time frame, which means that we need to do a better job in communicating what we are about to the public and to policy makers in Washington. We do not do that as well as we need to.

**Have any public events influenced your view of that?** Approximately three quarters of a million people have died in the last ten years as a result of major earthquakes. This should be a call to arms to the geoscience community to re-double their efforts. This requires major funding from federal authorities. The cost of research needs to be compared to the cost of rebuilding.

**Was there a particular event or a moment that crystallized your interest in earth science?** I was conflicted between physics and geoscience. But I have always loved the outdoors, and I also needed to earn a living.



*Joanne in 1985*



## Geosciences Staff Highlight

*This year, Director of Labs Owen Evans looks back*

I originally came to the Department (Earth and Space Sciences) as a graduate student in 1983. I think a big part of my interest in geology was trying to discover how things work. Gil Hanson's mass spectrometry lab was the perfect place to be. I'll never forget having the 6" NBS machine in pieces in the sink or Ben Vitale taking the voltage divider board home to wash it in his bathtub!

As much fun as the science was, I also always really appreciated and admired the support staff. This included the people in our "shops" (Fred Gwinner, Bob Muller, Al Catalano, Bill Huebsch, and Ben Vitale), the library (Mary Manna and Ros Wolcott), and the main office (Barbara Seimsen, Iris Roth, and Ann Riordan). Bob Warasila and Jim Broyles were the indispensable Directors of Laboratories during my student years.

After finishing my dissertation and abandoning my pursuit of a faculty position, I spent 6 years in University administration, eventually becoming Stony Brook's Associate Registrar. That too was plenty of fun, but not so much that I didn't jump at the opportunity to return to the Department in 2000 after Jim Broyles' departure to Penn State. It's hard to believe that 10 years have already passed. I'm happy and proud to be part of a department staff that prides itself in supporting the faculty and students. While many of the faces have changed, the Department still has the essential character I enjoyed when I first arrived. It's exciting to see careers blossom and evolve, and almost every day is punctuated by the excitement of discovering some new aspect of how things work.

*Owen Evans*



## Journeys of the Undergraduate Geology Club

By Kate Schwarting and Megan Bednarz



The Undergraduate Geology Club has become unstoppable in its quest to provide unique geology-related educational and social opportunities to students! 2009 brought many amazing events and activities to an ever-growing and expanding group of both geology

majors and non-majors. The club has worked hard to provide a diverse selection of activities in order to both appeal to a broad spectrum of students and fulfill the club's purpose of continuing science learning outside of the classroom.

Students got a chance to share their love of geology this year by creating informative and entertaining tables at campus events such as Earthstock, Recycle Mania, the Involvement Fair and the Shirley Strum Kenny Arts Festival. For the second year in a row members of the club also designed and built a boat for the annual Roth Regatta

The club received a second-place-in-a-heat trophy for the volcanic Pompeii-themed boat. Perhaps the most invaluable aspect of the club is its ongoing effort to get students out into the field through fun and educational local and long distance trips. These included a personal tour of the geology of Central Park, as well as the American Museum of Natural History, road trips to Luray Caverns, Natural Bridge, Shenandoah

National Park in Virginia, and the Smithsonian Museum in Washington D.C., as well as local beaches and parks.

During the trip to the Franklin Mineral Museum and Sterling Hill Mining Museum in Franklin, New Jersey, the club got a chance to collect fluorescent mineral specimens as well as walk through the darkened mine whose walls were covered in bright, glowing minerals. These field trips have given students hands-on experiences with the topics that they have learned about in the classroom.

This spring the Geology Club will continue holding study sessions and free 100-level tutoring hosted by its supportive network of dedicated geology students. The club is also planning several more trips for the new semester to places both near and far such as Dinosaur State Park, Connecticut and the Herkimer Diamond Mine in New York. They will also continue the popular bimonthly science-themed movie nights. The club will also return to selling T-shirts as well as mineral and gem specimens at Geology Open Nights. The beautiful specimens were generously donated to the club by Mrs. Conroy of Mastic Beach, New York, and will help fund club activities. The club looks forward to new members and bigger and better events in the coming months.



## Giving to the Department of Geosciences

The Department of Geosciences takes great pride in the “sense of family” that we have maintained ever since our beginnings in 1965. Your contribution to the Department enriches the experience for current and future students, faculty, and staff, and helps to maintain the atmosphere that you enjoyed. Contributions have been used toward special student scholarships and awards, classroom multimedia upgrades, field trips for courses, and other Departmental activities. If you have supported us in the past, we are most grateful, and hope that you will continue to do so. If you are interested in making a gift to the department, there are several funds to select from. You can give directly online ([www.geosciences.stonybrook.edu/giving/index.html](http://www.geosciences.stonybrook.edu/giving/index.html)) or by sending a check directly to us at:

Department of Geosciences, Chairperson; 255 ESS Building; Stony Brook University; Stony Brook, NY 11794-2100. Checks should be made payable to **Stony Brook Foundation, Fund #** (insert number as indicated below).

- Department of Geosciences General Fund (# 250500)
- Department of Geosciences Undergraduate Fund (# 299660)

Even if you are unable to support us now, we would still like to hear from you.

Rich Reeder

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