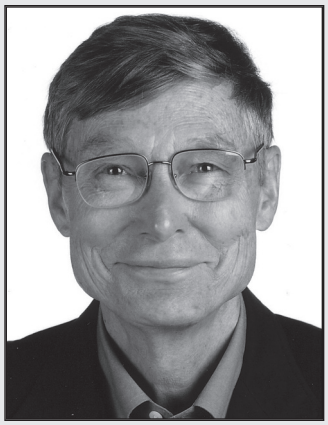
PENROSE MEDAL

Presented to W. Gary Ernst



W. Gary Ernst
Stanford University

Citation by Bruce R. Doe

Penrose Medalist W. Gary Ernst's family moved from St. Louis, Missouri, to St. Paul, Minnesota, when he was nine. We became schoolmates in the 5th grade. Up the street from his house was a large open field with a backstop the home of the Syndicate Cyclones baseball team. Gary was generally the sole player roaming the outfield, as we were not able to field a full team. Perhaps this is where he developed his abilities to meet challenges. At the age of nine, I had decided to become a chemical engineer, and Gary wanted to be a zoo director. In high school, Gary ran the mile, and, using his skills in persuasion, he rescued a high school fraternity from oblivion. During two summers after our senior year, we camped for a week at Glacier National Park (GNP). His parents held their breath but lent us the family car. We had two memorable trips to that wonderful country, broken by drives across the rolling plains of the Dakotas and Montana while listening to 45 minutes of country/western music, ten minutes on meet your neighbor, and five minutes on live stock.

Gary attended Carleton College in Minnesota, where he took up geology, lettered in hockey and football, and received a B.A. in 1953. He had the unusual distinction of publishing his undergraduate thesis on the St. Peter SandstoneGlenwood Shale in the American Mineralogist in 1954. Our trips to GNP had a lasting impression on me, such that I switched from Chemical to Geological Engineering at the University of Minnesota (U of M), being, I suspect, Gary's first convert to geology. Gary then went to the U of M and received an M.S. in 1955 with Samuel S. Goldich, who could have a difficult personality. No doubt Gary honed his abilities at diplomacy dealing with Sam. Gary's Masters Thesis on diabasegranophyre relations in the Endion sill near Duluth, Minnesota, was published in 1960 in the *Journal of Petrology*.

Gary received a Ph.D. from Johns Hopkins University in 1959 with Aaron Waters as advisor. He also had a preDoctoral appointment to the Geophysical Laboratory of the Carnegie Institution of Washington (CIW) with Joe Boyd and Hans Eugster providing guidance. There he approached the vexing problem of synthesizing chain silicates, starting with the sodic amphiboles. His initial paper on these concerned magnesioriebeckite which appeared in 1960 in *Geochimica et Cosmochimica Acta*. For these and related field and geochemical works on lowgrade metamorphism, Gary received the Mineralogical Society Award in 1968 and was inducted into the National Academy of Sciences eight years later.

Gary received an appointment to the University of California, Los Angeles (UCLA) in 1960 where he remained for 30 years, rising to Professor. He spent many years exploring lowtemperature, highpressure assemblages such as the glaucophanebearing blueschists of the Franciscan in California and elsewhere through both field and laboratory studies. In performing these investigations, he tested and supported them with detailed element partitioning, trace element, and an array of spectral and optical studies. By 1970, Gary had become interested in the plate tectonic environments of metamorphic rocks. I and many others felt that such things as blueschists were simply trash, but here he was blithely studying rejuvenated subduction and obduction zones; as it turned out, he converted the proverbial sow's ear into a silk purse. By 1976 his interests expanded to eclogites and peridotites in the Western Alps, Taiwan, and central China. Gary did all this while carrying a heavy administrative and teaching load. At UCLA, he was Chairman of the Department of Geology, Department of Earth and Space Sciences, and Director of the Institute of Geophysics and Planetary Physics.

In 1989, Gary moved to Stanford as Dean of the School of Earth Sciences from 1989 to 1994 and as a Professor in the Department of Geological and Environmental Sciences until his retirement in September, 2004. Two exciting series of investigations began with publications beginning in 1990. One concerns the Alcontent of hornblende (later including titanium) as a semiquantitative thermobarometer in a 1990 paper with Thomas and that was nicely presented in an experimental study of MORB in a 1998 paper with Liu. The other series concerns superhigh (or ultrahigh) pressure metamorphism, beginning with a paper coauthored with Zhou, Liou, Eide, and Wang in 1991. Superhigh metamorphism led him into new areas, such as the Maksyutov complex of the south Urals (discovering unusually lowtemperature metamorphic microdiamond), northern Kazakhstan, and eastern China. Gary had started two new research frontiers at age 60, an age at which youth considers you should only be watching the grass grow. And he has expanded into environmental geology, with a Geological Society of America (GSA) *Bulletin* paper last December on vegetation communities, geologic substrate, and microclimatic zones in the WhiteInyo Range.

Among his honors, he has served as the President of both GSA and the Mineralogical Society of America, is a Trustee of CIW, has had a W. Gary Ernst Scholarship established in his name at UCLA, and received the first Geological Society of Japan Medal in 1998. A three-day Ernstfest was held at the 2003 GSA Annual Meeting.

What became of Gary's early interest in being a zoo director? Maybe he did that too because he has had an impressive stable of strong-willed graduate students (14 M.S., 35 Ph.D.) and postdoctoral fellows (44), many with highly successful careers of their own. As impressive as Gary's research career has been, his real legacies are these students.

Response by W. G. Ernst

Rob, Bruce, fellow geologists, you do me a very great honor, and I feel especially humble when I consider the list of past Penrose Medal recipients. Be that as it may, many, many thanks! We celebrate scientific accomplishments with our awards, and far more of us contribute incrementally and substantially to the advancement of the discipline than can ever be properly recognized. To be singled out for such an honor, one must be industrious, intelligent, and lucky—and if I had to choose, I'd go for the latter. I should know. Here is a personal story I relate to my research students:

Long ago as a pre-doctoral fellow at the Geophysical Laboratory of the Carnegie Institution of Washington, I was investigating the physical conditions under which the sodic amphiboles are stable. To simplify, I started with mixtures of oxides plus excess H_2O that

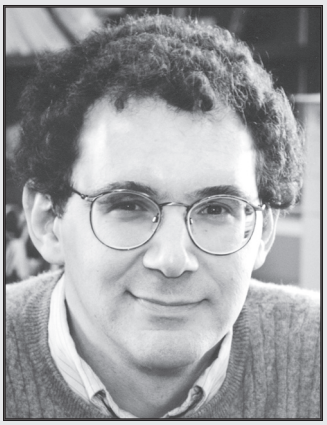
in aggregate yielded the exact composition of the particular mineral to be studied. Among the sodic amphiboles I worked on was glaucophane, $Na_2Mg_3Al_2Si_8O_{22}(OH)_2$—but you knew that formula, right? I was quite aware of the geologic occurrence of glaucophane-bearing schists, and suspected that this mineral would be stable only at relatively high pressures and low temperatures. To my surprise, it crystallized in my laboratory experiments at more than 800 °C at 1-3 kilobars fluid pressure. So, I conducted further phase equilibrium experiments, characterized the synthetic glaucophane in considerable detail, and computed its thermodynamic properties. Seemingly, peculiar chemical conditions including low Ca, high Mg and Na concentrations, not high pressures, were required for its crystallization in nature—or so I thought. At the same time studying mafic glaucophane schists (i.e., blueschists) in the California Coast Ranges, I was confounded to discover that the well-known Franciscan blueschists were not of unusual chemistry, but were normal metabasalts in bulk composition. On further pondering, I concluded that, even though it was indeed stable at low pressures and high temperatures, other mineral assemblages took the place of glaucophane in common greenschists, and that multi-phase reactions (which I and others calculated) promoted the crystallization of glaucophane in the metabasalts only at elevated pressures.

Further geologic mapping combined with analytical studies confirmed the presence of additional high-pressure, low-temperature minerals in the blueschists of California and indeed, around the World. At that time, no one could explain how such physical conditions could have arisen, but fortunately, along came the recognition of a dynamic Earth in the form of plate tectonics. The high-pressure, low-temperature thermal structure of subduction zones provided a persuasive answer to the glaucophane schist problem. The story is not quite over, however, for later experimentalists demonstrated that actually, I had not synthesized $Na_2Mg_3Al_2Si_8O_{22}(OH)_2$ after all—but rather the rare amphibole sodium-magnesiorichterite. My oh-so-careful glaucophane work was thrown into a cocked hat, but by then I was pushing plates for a living. Using the California Coast Ranges as a base, I moved on to conduct diverse petrotectonic studies in SW Japan, the western Alps, Taiwan, southern Russia, Kazakhstan, and central China, involving both field-based and experimental phase relations of mafic and ultramafic rocks, and ultrahigh-pressure metamorphism. From this experience, my advice to students became “Do the very best you can, but don’t ever look back, and don’t beat yourself up over honest mistakes!” I concluded that it’s good to be smart, but it’s a whole lot better to be fortunate in the scientific problems that you choose to study.

Although I gratefully and sincerely thank friends and scientific colleagues for this special recognition, as a teacher, I insist that this Penrose Medal must recognize my own professors’ intellectual guidance and support—Dunc Stewart and Eiler Henrickson at Carleton College, Sam Goldich at the U of M, Aaron Waters at Johns Hopkins, and Joe Boyd, Hans Eugster, Frank Schairer, and Hat Yoder at the Geophysical Laboratory; this recognition is partly their doing. Some of the other responsible geologists are my colleagues at UCLA, the USGS-Menlo Park, Stanford, and Japan (e.g., Clarence Hall, Bob Coleman, Louie Liou, Yotaro Seki, Shohei Banno, and Shige Maruyama), as well as a terrific group of students (of whom I am inordinately proud); they have given me much more than I gave them. Lastly, but certainly not least, my wife Charlotte has provided me with steadfast love, unflinching support during geologic capers to various far-away corners of the World, and has insistently, persistently attempted to educate me to the finer things in life for longer than most of you have been on the planet. So, my heartfelt thanks to all of you for this special geologic recognition—I’ll try to do a little better next time.

ARTHUR L. DAY MEDAL

Presented to Edward M. Stolper



Edward M. Stolper
California Institute of Technology

Citation by David Walker

During the 1970s the moon, the planets parental to meteorites, and Mars joined the petrological agenda. Ed Stolper famously engaged this trifecta. As a Harvard undergrad in Jim Hays' lab Ed had the distinction of producing a thesis on the chemistry of lunar glasses which showed similarities to howardite meteorites. The light of the thesis was eclipsed by the heat generated by interaction with Ted Ringwood — without presenting the thesis. His master's effort was undertaken in Mike O'Hara's lab on the petrogenesis of the most important group of achondrites, eucrite meteorites. Ed showed that the prevailing notion that the eucrites were low pressure end-stage residues was less likely to be correct than that they were low pressure partial melts, a view that could also place howardites and diogenites into context. Having sorted out 4 Vesta (or from wherever else it is that the HED suite comes), Ed returned to Harvard to take on the rest of the solar system for a Ph.D. He produced an extraordinary synthesis of the SNC meteorites. The SNC source regions are Earth-like, although they are clearly not from the Earth. Ed showed that the proper sort of source region could be formed by charging a lunar or eucritic source region with an alkali-bearing component to stabilize clinopyroxene — an extraterrestrial mantle metasomatism if you like.

While Ed was writing up his thesis, I was busy trying to see if we had learned anything from the recent planetary explorations, which might be extrapolable. It looked to me as if planet size was a pretty good metric for fruitful comparisons. Several characteristics of igneous rocks correlate with the size of their body of origin, from bodies the size of 4 Vesta at the low end of the range sampled, up through the Moon, and on through the Earth at the high end of the size series. I ran a draft of this past Ed. It was returned with a fair amount of indignance. I mean didn't I know that the SNCs were asteroidally sourced? Because SNCs give a clear size reading somewhere between Earth and Moon, in terms of supposed size-related characteristics, size must be a bunch of nonsense. Thinking fast I replied, "Oh, you mean they have to come from Venus or Mars?" This bit of light entertainment on my part earned me a lecture on why I would better spend my time looking for the causes of things rather than looking at airhead correlations. True. But less than a day later Ed came back with the recent Viking Martian soil XRF analysis which he had stripped of sulfate and had shown was then indistinguishable from Shergotty. This was the start of "SNCs are from Mars" and although published early, it was not taken very seriously by anyone (truthfully, including us) for some time. Only later were lunar meteorites discovered in Antarctic ice leaving Jay Melosh uncharacteristically quiet about how it was impossible to get them here without destroying them. And also later N_2 isotopes in gas bubbles in splash glass on an antarctic SNC proved to match the Martian atmosphere. Ed covered all this ground before he had his first real job!

This brings us to his 25 years at Cal Tech. I have time to do little more than illustrate this period with an example. H_2O, CO_2, Ar, etc. effervesce from volcanoes and can be made to dissolve into pressurized laboratory melts. How they do this and to what extent they do it and at what P,T, and X has been a matter of considerable interest since the early days of experimental petrology. Maybe we will never know if Barclay Kamb and George Rossman conspired to establish Ed's new presence at Cal Tech near George's IR lab or whether this was an accident. Either way the result is history. IR spectroscopy has proven admirably suited in Ed's hands to unraveling of the abundance and speciations of volatile substances in silicate liquid. Ed and his students have produced a stream of classic papers on topics including the solubility, internal speciation equilibria, and transport of these substances in glassy and liquid silicate. From this we have learned the solubility mechanisms and their dependence on composition. We also know more about degassing rates that impact styles of volcanism. Perhaps as important as the volatile budget itself is the associated material which is found to correlate with water in back arc basin basalts and subduction zone magmas. Ed and his colleagues have also explored the effects of volatiles on the physics and chemistry of the source melting part of the petrogenetic cycle with detailed thermodynamic models.

The first half of Ed's career has been considerably more productive and innovative than most full careers. He has gone from one spectacular accomplishment to another: eucrite melting, SNCs from Mars, "sandwich" MORB melting, H_2O-OH-CO_2-CO_3 by IR; melt densification with pressure, continuous coordination change with pressure, density controls on eruption, fluid-related components in magma petrogenesis, magma degassing and volatile transport, activity models from limiting noble metal alloys, diamond traps for high-pressure melts, adiabatic melting analysis, Hawaiian stratigraphy, … the list is incredible. Please believe this list and join me in congratulating Ed Stolper with the Day Medal. We look forward to seeing what the second half of his career will bring.

Response by Edward M. Stolper

Thanks, Dave, for that generous introduction. I first met Dave at Harvard in the fall of 1970, when I was a 17-year-old freshman and he was a graduate student. He has been a close colleague, friend, and mentor ever since, so I am very pleased that he was able to introduce me today.

When I listen to the list of accomplishments that Dave ascribes to me, several things strike me.

First, although most of the problems I have worked on involve igneous processes, there is otherwise no simple theme to them, and it has sometimes appeared to me to be a random walk. Some studies have been experimental and some theoretical; some such as drilling in Hawaii involved field work and others were computational; some of the experiments were at atmospheric pressure but others were at pressures to hundreds of kilobars; some studies have dealt with terrestrial processes but others had to do with extraterrestrial processes. To be honest, this has always bothered me a bit, because I greatly admire scientists who identify an important problem, develop a coherent, long-term plan, and then proceed to make systematic and deep contributions to that problem. My approach has been more opportunistic, often by chance

learning of something new that intrigued me; or stumbling across an idea (like the notion mentioned by Dave that certain meteorites might come from Mars); or having a colleague suggest that there is an important problem that I might consider thinking about; or reading a paper with a group of students and deciding that we could resolve an issue raised in the paper; or hearing a seminar on something and deciding that I had a better idea; and so on. Although the opportunistic approach has its rewards, I confess to sometimes wondering from where the next interesting idea might come, if at all.

Second, in pursuing this eclectic approach to being a scientist, I was molded by my time with Dave and Jim Hays as an undergraduate and graduate student at Harvard and by Mike O'Hara as a graduate student at Edinburgh, but even more so by my long association with Caltech. University departments have cultures that make them distinctive, and these represent and symbolize a value structure on which the department prides itself and that is passed on to the students and young faculty members who join the community. I have come to believe that the definition of departmental culture and its imprinting on future generations are among the most important aspects of academic leadership. In my own case, interactions with senior colleagues at Caltech, among them Tom Ahrens, Sam Epstein, Barclay Kamb, Bob Sharp, Lee Silver, and Jerry Wasserburg, played especially significant roles in helping me to form my own value structure as a scientist.

Third, when you try to cover so much ground, you surely cannot do it all by yourself, because you are constantly venturing into new areas where you cannot know or understand all the background or subtleties, so you need colleagues willing to work with and guide you. For me, these have included many gifted students, postdocs, staff members, and faculty colleagues at Caltech and elsewhere. How in the world could I have worked on hydrogen and carbon isotope fractionation between magmas and vapor without Sam Epstein? How could I have studied the shock wave compression of silicate melts without Tom Ahrens? How could I have known how to quantify H_2O- and CO_2-bearing species in glasses and melts without George Rossman? I would never have pursued drilling in Hawaii without Don DePaolo and Don Thomas. Who would ever have expected me to study oxygen isotopes in ocean island lavas on my own, without John Eiler and Ken Farley? And any insights I have had into isentropic mantle melting and the validation of them using state-of-the-art thermodynamic modeling would have been for naught without Paul Asimow and Marc Hirschmann. The list goes on and on, and needless to say, I thank you all, including those I have not mentioned.

And finally, for many of the topics Dave mentions, I could assemble a group that would swear up and down that I got it all wrong! To them, I would only say that a diversity of viewpoints on complex problems — and nearly every problem in earth science is complex and typically underconstrained — is a sign of a healthy community. But there is another angle to this I would like to emphasize. I will always recall overhearing a meeting between our Penrose medalist, Gary Ernst, and a much younger scientist. Gary was still at UCLA at the time, and we had wonderful monthly lunchtime seminars in which we brought together the petrologists and geochemists at Caltech, UCLA, and USC. We were meeting in the Buwalda Room at Caltech that month, and as we were assembling before lunch began, the younger scientist was lying in wait for Gary, and accosted him with some new results on amphibole stability that disagreed with work Gary had done decades before. The younger scientist took up an aggressive posture, expecting a blast from the great man. But Gary put his arm around the younger man's shoulders and disarmed him with the simple statement, "Oh, I'm so glad someone finally got that right." The point is that sometimes scientists contribute by posing important problems, thereby stimulating significant work by others. And I certainly hope that if faced with a similar situation, I will have the class to follow Gary's example.

Thank you Dave, members of the audience, and the GSA for this great honor. Several of my friends, colleagues, mentors, and heroes are previous Day medalists, and I am pleased and humbled to have my name appear on the same list.

YOUNG SCIENTIST AWARD (DONATH MEDAL)

Presented to Brian K. Horton

Brian K. Horton
University of California, Los Angeles

Citation by Raymond V. Ingersoll

Brian Horton is superbly qualified to be this year's recipient of the Donath Medal, awarded to this promising young scientist who has already contributed greatly to our understanding of the interplay of sedimentation and tectonics. His publications document and discuss sedimentation within a Cenozoic extensional basin of Nevada, Cenozoic history of crustal shortening and basin evolution in the Altiplano Plateau and retroarc foldthrust belt of the Bolivian Andes, feedback mechanisms among climate, erosion and tectonics, the significance of fluvial megafans, basin development and crustal thickening in Tibet, and the dynamics of coarse-grained sedimentation in the USA Cordilleran foreland. In addition, he is presently conducting field research in Iran! Brian gets around!

Born in California in 1970, Brian attended the University of New Mexico as an undergraduate, where he received his BS in 1992; he received his MS from Montana State University in 1994, and his PhD from the University of Arizona in 1998. Both his MS advisor Jim Schmitt and his PhD advisor Pete DeCelles testify that Brian was not only the best graduate student they have supervised, but the best that they have known! In both cases, Brian arrived at his graduate institutions with thesis topics fully in mind, and even developed his own funding, including an NSF Graduate Research Fellowship. He went to Bolivia because it was the best place to combine detailed stratigraphic and structural analyses with regional tectonic controls in a frontier geologic setting. He developed the logistics and funding for his thesis project completely on his own.

Brian sets an example of rigorous interdisciplinary study of tectonics, structure, sedimentology and stratigraphy in order to solve fundamental problems through the integration of field work, laboratory analysis and regional synthesis of active tectonic settings. All of Brian's field work (and that of his students) combines rigorous and detailed measurements acquired over long field seasons under logistically difficult conditions. As a result, each of his publications includes a major contribution of data, as well as insightful analysis and synthesis. Brian's publications are characterized by the most exacting standards of documentation and analysis; they are sure to have long shelf lives.

Since coming to UCLA in 2001, Brian has attracted a growing group of excellent graduate students, as well as frequent visiting scientists and post-docs. He has imparted to all who work with him, from undergraduate students to senior collaborators, his intense belief in rigorous interdisciplinary studies to solve fundamental problems in sedimentation and tectonics.

Over the last eight years, Brian has achieved a leadership position among Andean geologists. He has worked throughout Bolivia, as well as in Peru and northern Argentina. His work has generated tens of kilometers of detailed stratigraphic sections, hundreds of petrographic modal analyses, several $^{40}Ar/^{39}Ar$, palynological and fission-track ages, thousands of paleocurrent measurements, many kilometers of magnetostratigraphic sampling, regional mapping, and correlations of many stratigraphic units. For many years, the consensus literature has taken the onset of Andean orogenesis to be latest Oligocene or Miocene. Brian has demonstrated that the stratigraphic record of Bolivia indicates an earlier Paleogene onset for regional crustal shortening.

Brian is relentless in his pursuit of new problems, wherever they may lead him and his expanding group of students and coworkers. He has mastered whatever techniques and modeling methods are needed to answer important questions. He is adept at all aspects of traditional sedimentologic and stratigraphic analyses, as well as magnetostratigraphy, chronostratigraphy and thermochronology. It is unusual for a young scientist to exhibit both the breadth and depth of knowledge and experience which Brian demonstrates.

In summary, it is my distinct honor and pleasure to present the 2004 Donath Medalist, Brian K. Horton.

Response by Brian K. Horton

To receive the Donath Medal from the Geological Society of America is a sincere honor that I consider a measure of the current vibrant research by many people in the overlapping fields of tectonics, sedimentology, and structural geology. Important challenges remain in our understanding of the interplay among mountain building, climate, and sedimentary basin evolution, making today an exciting time to be involved in multidisciplinary research on diverse geological problems.

As a graduate student, I was fortunate enough to have interacted with many talented, dedicated scientists. Topping the list of mentors is Peter DeCelles at the University of Arizona, who set a high standard and led by example through creativity and rigorous data collection on an array of projects. Pete taught me to develop a healthy skepticism for the leading interpretations, whether on Andean orogenesis, alluvial fans, or the dynamics of foreland basins. At Montana State University, Jim Schmitt and Dave Lageson emphasized critical thinking, careful field investigations, and the value of digging intensely into existing literature. Several Arizona people were instrumental in helping me appreciate the geophysical constraints on regional deformation, notably Susan Beck, George Zandt, and Bob Butler. I am also indebted to the late Peter Coney for his inspired teaching, outstanding field trips, and infectious enthusiasm for the Andes and North American Cordillera. His example guides my teaching (although I remain a novice pipe-smoker), which culminated last summer in a course fieldtrip to Bolivia that would have brought a grin to Peter's face.

More recently, the remarkably diverse faculty of the University of California, Los Angeles (UCLA), who span a tremendous range of the Earth and space sciences, have provided a stimulating environment. My citationist Ray Ingersoll, 1994 Donath medallist An Yin, Gary Axen, and other outstanding people generate an energized, collegial atmosphere while constantly motivating me and my students to strive for improved understanding of tectonic processes. Naturally this award only raises their expectations, but I welcome the challenge.

Because I spend extended periods in the field, often in international locations, I am particularly grateful to innumerable colleagues from South America, Asia, and the Middle East for sponsoring these expeditions and invariably kindling new perspectives on magnificent geological problems. Of course none of this research would be possible without financial support from the National Science Foundation (NSF) and American Chemical Society's Petroleum Research Fund.

To my parents, I would like to express my gratitude for their unwavering support over the years. I always take great pride in relating the latest field adventures to my dad, who inspired me with tales of motorcycling across the U.S., Mexico, and Europe. Last summer I had the privilege of showing him around the Bolivian Andes by tour bus, while he entertained a cadre of UCLA students.

My wife Danielle deserves the utmost thanks for her encouragement and understanding along the way. I still marvel at, and take inspiration from, her abilities and dedication in teaching science to young, junior-high minds.

In closing, I must mention the pivotal role of several early research opportunities. I am one of the early products of NSF's Research Experience for Undergraduates (REU) program. As an undergraduate at the University of New Mexico, I was able to conduct research on paleomagnetic and hydrogeologic REU projects with John Geissman and Michael Campana. Those experiences were crucial in my decision to pursue advanced degrees and a research-oriented career. Continued support through NSF's Graduate Research Fellowship program and Postdoctoral Fellowship program opened the door for new ventures. Finally, several research grants from GSA were instrumental in the completion of my graduate research projects. GSA continues to make a difference for many young scientists and it is a pleasure to be recognized by a society that regularly fosters student research. Thank you again for this honor.

GSA DISTINGUISHED SERVICE AWARD

Presented to Donna Russell and Peter Lipman

Citation to Donna Russell by David A. Stephenson

Donna Russell is the epitome of what GSA's Distinguished Service Award was created to honor: exceptional and devoted service to the Society and its Foundation. Donna is the heart and soul of GSA's Foundation. Her talent for remembering details, names, faces, and events is extraordinary. Her effectiveness as Hostess of the annual Senior Fellows Reception has been key to attendance at that function. And, one only has to visit the Foundation's booth at the annual exhibits and observe Donna's magnetism in drawing folks to discussion.

Donna is the organizational guru of the Foundation, a dynamic force behind past and present GSA programs and Directors. She is the Foundation's institutional memory and has proven to be its most devoted supporter, having been with the Foundation since December, 1980, when it was created. AND, with Donna, GSA has been graced with a two-for-one package: Donna's husband, Jim, also deserves recognition for his efforts (and photography) provided for the Society throughout the years and especially at the annual conference.

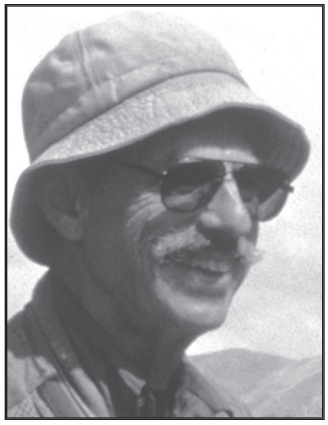
When that far-off day comes when Donna retires, we will sadly witness the rare occasion when on withdrawing one's arm from a pail of water, a hole remains. GSA has had a wide variety of staff and officers over its 116 years of existence, but few have displayed the depth of pride of association with the Society as shown by this year's recipient of the Distinguished Service Award. All GSA members owe Donna our recognition and resounding appreciation for a job very well handled.

Response by Donna L. Russell

It is such an honor it to receive the GSA Distinguished Service Award.

I have had the privilege to work for the Foundation for the past 23+ years. GSA has so many wonderful members and it is their commitment to GSA that has helped the Foundation support so many programs.

I sincerely appreciate receiving this recognition - This is the highlight of my Foundation career. Thank you so much!



Citation for Peter W. Lipman by John E. Costa

Peter Lipman is well-known to many of us for his magnificent scientific accomplishments in the field of volcano geology including field mapping, studies of ancient and active volcanoes, documentation of gigantic submarine landslides, and volcano hazards. You can most likely reach him on the slopes of Mauna Loa or in the San Juan Mountains in Colorado. Today, Peter is a recipient of the Distinguished Service Award from the Geological Society of America for his service as Councilor, and member of the Executive Committee (2000-2003), Budget Committee, Finance Committee, and Audit Committee from 2000-present. This was a crucial time for GSA characterized by financial difficulty as the stock market was in serious decline and GSA was spending $3M more per year than it was taking in as revenue. Because of his personal philanthropy, Peter had extensive experience in finance and budgets. He was the leader of a broad and committed group of GSA elected officials who, with the help of a new Executive Director and Controller, reversed the fiscal situation of GSA, with ideas, examples, questions, and policy. His nomination comes from this group of GSA leaders with whom he worked. Starting next year, GSA's operational budget (excluding the research grants) will be self-supporting and no longer require withdrawals from the endowment. I cannot overstate the influence of Peter Lipman in the discussions and decisions that led to this remarkable recovery. He helped secure a strong and bright future for GSA, and for his wisdom and council, today receives the Distinguished Service Award.

Response by Peter W. Lipman

This award really should be shared by a large group of the elected officers and managerial staff of GSA. Starting in 2000, newly in-place leaders of the Society formulated a rigorous multi-year approach to difficult operational and financial realities that had long been avoided. By accident of timing as a just-elected member of the GSA Council, I necessarily became heavily involved in this effort to deal with an unsustainable situation--along with my citationist among others. Impending disaster does strongly focus the mind, even if at times causing anguish about appearance of a "Chicken Little" approach. Although involving difficult decisions and painful actions, the resulting efforts at GSA in growing income while reducing expenditures, without adversely affecting the Society's important roles in promoting the earth sciences, have been a uniquely gratifying experience for this research-oriented scientist. Volunteer service to the broader community, including the professional societies, adds rewarding dimensions to one's personal life, including new friendships, exposure to novel problems, and personal growth. Above all, feeling that one can make a difference is its own incentive. Thank you for this honor.

PUBLIC SERVICE AWARD

Presented to Robert D. Ballard

Robert D. Ballard
Founder and Chief Scientist
JASON Foundation for Education

Citation by Diana Lee Crew

Dr. Robert Ballard is an award-winning deep-sea explorer who is best known for his 1985 discovery of the Titanic. Born June 30, 1942, in Wichita, Kansas, Robert D. Ballard grew up in San Diego, California. He earned a Ph.D. in marine geology and geophysics from the University of Rhode Island's Graduate School of Oceanography, where he is currently a full-time faculty member. He spent 30 years at Woods Hole Oceanographic Institution (WHOI) in Massachusetts, where he spearheaded the development of manned submersibles and remotely operated vehicles for marine research. While at WHOI he founded the Deep Submergence Laboratory. In 1997 he created the Institute for Exploration in Mystic, Connecticut where he is President.

Throughout his career Ballard has conducted more than a hundred deep-sea expeditions, using both manned and unmanned vehicles. Beginning in 1973, Ballard participated in his first international expedition, Project FAMOUS (the French-American Mid-Ocean Undersea Study). This was the first manned exploration of the Mid-Ocean Ridge which helped to confirm the newly emerging theory of Plate Tectonics and won wide acclaim within the oceanographic community. In 1977, Ballard was Co-Chief Scientist of the Galapagos Rift expedition that discovered hydrothermal vents and their exotic ecosystems based on "chemosythesis." By 1979, Ballard was scientist in charge of the ANGUS exploration program on the East Pacific Rise that discovered the first "Black Smokers," a discovery that helped for the first time to explain the chemistry of the world's oceans.

In 1989, Dr. Ballard created the JASON Foundation, an educational program designed to inspire in students a lifelong passion to pursue learning in science, math and technology through exploration and discovery. Ballard would later develop telecommunications technology to create "telepresence" for his JASON Project, which today serves over 1.4 million students and 36,000 teachers annually in the US, and abroad in countries like Mexico, bermuda, Panama and Australia.The Project allows students in grades 5-8 children to accompany him from afar on undersea and above ground scientific explorations around the globe. This great science experiment is now helping to reform science education around the country by offerieng real world experiences to children in their classrooms. These students are involved, and engaged in inquiry and we hope to see many more students entering the world of science as careers.

Dr. Ballard has 13 honorary degrees and 6 military awards; he served in the U.S. Naval Reserve as a commander for 30 years. In 1996, he received the National Geographic Society's prestigious Hubbard Medal for "extraordinary accomplishments in coaxing secrets from the world's oceans and engaging students in the wonder of science." In 2003, he received the National Humanities Medal from the National Endowment for the Humanities. He has published 18 books, numerous scientific papers and a dozen articles in National Geographic magazine. He is a National Geographic Society Explorer-in-Residence.

Response by Robert D. Ballard

I want to thank the Geological Society of America and in particular its Awards Committee for honoring me tonight with this Public Service Award. I have been fortunate to receive other awards in the past but this one is particularly important to me since it comes from my geological colleagues. I am sorry I can not be here tonight as I am committed to an educational outreach effort that seeks to interest young people in science and technology. I also recognize that this award is not only for me but my entire team at the JASON Foundation for Education. For the last 15 years, that team has labored hard in the field to bring excitement of field research to more than 7 million students across our country and around the world as we work to create the next generation of geologists. Once again, many thanks for this wonderful award.