

volunteers across the nation in all 50 states and Puerto Rico. These competitively selected volunteers convey the exciting discoveries and plans in space research, exploration and technology through non-traditional forums; e.g. community service clubs, libraries, museums, planetariums, "star parties," mall displays, etc.

One of the challenges of running a low-budget, nationwide program is adequately instructing these volunteers over long distances and different time zones. For the past 2-1/2 years, the process of educating Ambassadors has evolved into a refined system that not only allows for mission-related topics, but supports enrichment subjects as well.

Ambassadors participate in on-line (web-based) training sessions that provide interaction with NASA scientists, engineers and project team members. As such, each Ambassador's experience with the space program becomes personalized. Training sessions provide Ambassadors with general background on each mission and educate them concerning specific mission milestones; eg. launches, planetary flybys, first image returns, arrivals, and ongoing key discoveries. On-line archives of each session's materials and training transcript provide Ambassadors with a personal reference library of mission-related information. Supplemental hard-copy materials are sent to each Ambassador, as available, to reinforce his/her knowledge of each mission's goals and events.

Integrating volunteers across the country in a public-engagement program helps optimize project funding set aside for education and outreach purposes, establishing a nationwide network of regional contacts. At the same time, members of communities across the country become an extended part of each mission's team and an important interface between the space exploration community and the general public at large.

URL: <http://www.jpl.nasa.gov/ambassador/front.html>

ED62A-12 1635h

Earth Science by Design: A Novel Approach to Professional Development

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Earth Science by Design (ESBD) is a three-year project funded by NSF to develop and publish a program of professional development in Earth science for middle school teachers. Based on the work of Wiggins and McTighe (1998), its goal is to help teachers become more effective designers of curriculum units for their classrooms. Teachers begin the program by participating in a two-week summer institute in which they learn the principles of "backward design". ESBD helps teachers organize their teaching around the "big ideas" in Earth science (NSES and Benchmarks), develop essential questions that give meaning to instruction and inquiry, create performance assessments, and identify visualizations such as satellite images to incorporate into their teaching. During the institute, earth scientists engage teachers in activities that help teachers to focus on the "big ideas" of Earth science and learn how to incorporate visualizations into their teaching. The workshop leaders also help teachers to frame curriculum units around central questions that serve to unify various disciplines of science through an Earth systems approach. As a result, teachers begin to explore and think about science content in a much deeper way than is often practiced in classrooms or presented in science textbooks. After they become comfortable with the approach and the science content, each teacher participant designs a classroom unit that they wish to teach. Teachers research the content and consult with scientists on content issues. During the school year following the institute, they teach the unit and are observed by the project team and by a teacher peer. Teachers attend two two-day conferences at which they receive further professional development and share the results of the teaching of their units. ESBD will be evaluated and revised for the summer of 2003. The final project product will be a professional development handbook and web site that scientists and school district leaders can use to implement ESBD throughout the country. At this session, we will share the design of the program and what we have learned to date about effects on teacher behavior in the classroom and student learning.

URL: <http://esbd.terc.edu>

ED71A MCC: Hall D Sunday 0830h

Faces of Diversity: Profiles of Women Geoscientists Posters (*joint with G, OS, S, SA, V, PA*)

Presiding: R Johnson, University

Corporation for Atmospheric Research/National Center for Atmospheric Research; C O'Riordan, American Geophysical Union

ED71A-0041 0830h POSTER

Profiles of Women Geoscientists on the Internet: Where are They, Who are They Written For, and Is Anyone Looking For Them?

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The internet is a powerful tool that can be used to transfer information, and it can be especially valuable to share information about women in geoscience careers. However, there is a paucity of information on the internet that highlights women in geoscience fields. Two notable websites, the Association for Women Geoscientists (AWG) (<http://www.awg.org/eas/profiles.html>) and Woods Hole Oceanographic Institutes Women Exploring the Ocean (<http://www.womenoceanographers.org/>) have excellent details on the backgrounds and experiences of women in these disciplines. Yet beyond these web sites, individual profiles are incorporated into other sites and difficult to find.

The format of women geoscientist career profiles varies greatly. Some profiles have more of a resume listing where the individual received their degrees, dates and titles of job positions, awards, etc. Other profiles are informal and more of a narrative, detailing what first interested this woman in the geosciences and what has been the most interesting and challenging parts of her job. Clearly, the target audience for these profiles is different. If we wish to place profiles of women geoscientists on the internet, it is important that we keep in mind the focus of who we want to reach with this information.

The question also exists if anyone is searching for profiles of women geoscientists on the internet. I have a website that is a clearinghouse of information about women in science and career profiles of women geoscientists (<http://www.sciencecareersweb.net/>). A tracking program connected to the website documents usage statistics, such as what keywords are entered into internet search engines to bring people to different parts of my website. Surprisingly, few internet searches are being done with the key terms women geoscientists. Are individuals not interested in this information, or are they not aware that these resources are available to them?

It seems as if more can be done to increase the visibility and quantity of information to current professionals and young up-and-coming female students considering a career in the geosciences. This lack online resources is a hurdle and challenge we should attempt to change to strengthen the female representation in the geoscience discipline.

URL: <http://www.sciencecareersweb.net/>

ED71A-0042 0830h POSTER

Update on the Gender Gap in Geophysical Sciences Research

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In 2002, what progress has been made in recruiting and retaining women in geoscience fields? We will describe the academic pipeline and the critical transition points for women in science including data over the last 15 years on the representation of women among degree recipients in both geoscience and related disciplines.

We will include data on women among African Americans and Hispanic Americans who have earned degrees in the geosciences during the last decade. We will also review where the women are in the geoscience workforce and how this has changed over time. Finally, we will propose for discussion some initiatives for change in policies for women in science both within and outside of academia.

ED71A-0043 0830h POSTER

Does size matter?

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What are the benefits and challenges of being a female research professor at a small university? Stepping off the "fast-track" is seen as an appealing option to many women as a way of balancing multiple priorities of family and research interests. However, there are unique challenges at being at a small university. This presentation will highlight some of my experiences that have allowed me to successfully conduct scientific research at a small university.

ED71A-0044 0830h INVITED POSTER

An example of woman scientist in France

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Although the presence of women in sciences has been increasing in the past few decades in Europe, it remains incredibly low at the top levels. Recent statistics from the European Commission indicate that now women represent 50 per cent of first degree students in many countries. However, the proportion of women at each stage of the scientific career decreases almost linearly, reaching less than 10 per cent at the highest level jobs. From my own experience, I don't think that this results from sexism nor discrimination. Rather, I think that this is a result of complex cultural factors making women subconsciously persuaded that top level jobs are destined to male scientists only. Many women scientists drop the idea of playing a role at high-level research, considering it is a way of exerting power (a matter reserved to men). Others give up the possibility of combining childcare and high level commitments in research. And too many (married women) still find only natural to sacrifice their own scientific ambitions to the benefit of their spouse's career. In this poster, I briefly present my personal experience. I chose to prioritize scientific productivity and expertise versus hierarchical responsibilities. Besides I tried to keep a satisfactory balance between family demand and research involvement. This was indeed facilitated by the French system, which provides substantial support to women's work (nurseries, recreation centers during school holidays, etc.). To my point of view, the most promising way of increasing the number of women at top levels in research is through education and mentality evolution.

ED71A-0045 0830h INVITED POSTER

Two career chaos

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Lisa Tauxe, Scripps Institution of Oceanography, La Jolla, CA 92093-0220, United States

When I finished graduate school I suppose I imagined myself as my dad. He worked hard, loved his job and family, made a good living. But I also saw myself as my mom - making a home, raising kids, cooking dinner, saving the world. I thought: I can handle being my mom and my dad. I can handle being a scientist and a mother. I can DO this.

What I never imagined was the chaotic dynamic of the two career couple. The motions of bodies moving in response to the force of gravity cannot be predicted exactly if there are too many bodies. They dance in a jerky jumble, now faster, then slowly, bouncing, jostling, bumping and flying apart. Just so are the career trajectories of the two career couple. One rises up, the other, slower, pulls it down; overtaking, blocking preventing, now supporting, pulling along, now holding back - not moving, leap frogging, racing in opposite directions and snapping back together with a crack.

The problem is non-linear. The outcome depends on feedback, whether positive or negative. The outcome cannot be predicted. Cannot be determined.

Perhaps it cannot be done. Perhaps both husband and wife cannot be both mother and father. Too many mothers, too many fathers. Chaos.

But I believe it can be done. Not like our mothers and fathers but a different way. And maybe our jerky paths will keep us sharp, make us work harder, and lead us through lives that at least cannot be described as dull.

ED71A-0046 0830h INVITED POSTER

Reasons Why Some Women Quit Science

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Nearly half of all graduate students majoring in various disciplines of science today are women, yet men still predominate the faculty makeup at most universities and research institutions. This issue was discussed at length last year in the journal *Science* and also in the *Chemical Engineering News* (the ACS weekly publication magazine). The question is: why do so many women decide to major in science but not to pursue a career in science? Over the years I have seen highly capable women quit science for two main reasons. First, intimidation that can be very difficult to deal with when someone is just starting a career in science. Thus, I encourage young women to make a sincere effort to surround themselves with colleagues who are both knowledgeable and considerate. Keep in my mind that you have a choice to choose your future collaborators, so make some smart choices early on and throughout your career. Second, is the need to balance the demands of work with those of family life. Personally, I don't believe a tenure system is fair to young women who wish to have children during this appointment. The level of stress can be very high, which prevents women from applying to a position where they are given only a few short years to prove themselves. Also, try not to make a radical decision (i.e. quit science) if you are too stressed. Talk to more senior women in the field to learn how to better deal with your stress. After all a career in science has many ups and downs, and to survive, one needs to balance the good and bad days. In this talk I will address the questions outlined in the announcement as they relate to me. Overall, my advice to young women who are just starting their scientific careers is to celebrate your accomplishments and learn from your mistakes.

ED71A-0047 0830h POSTER

The Science of a Life - Career Path of an African American Geoscientist

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A career in the field of geophysical fluid dynamics is not an apparent choice for an African American woman from rural North Carolina. It was, however, the choice made. As a first generation college graduate, the catalyst to pursue such a career path was provided by those external to family; however, internally, the pursuit of education was valued, expected and required. It is this, the expectation and requirement, which serves as the foundation for the discussion of the balance of life in terms of family, education, and career.

There are no scales in existence on which to measure the balance of life. The selected educational institutions, Spelman College, The George Washington University, and Princeton University; nor career positions, National Aeronautics and Space Administration, AT&T Bell Laboratories, institutions of higher education, consulting opportunities, discuss, promote or encourage such a balance. Defining this balance, however, is a science that can only be advanced and achieved by the individual in relationship and partnership with community. The science and balance of a life is the focus of this discussion.

ED71A-0048 0830h POSTER

A Career in Marine Geology with the Naval Research Laboratory

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Naval Research Laboratory Marine Geosciences Division, Code 7420 4555 Overlook Ave SW, Washington, DC 20375

The voyage leading to my present position as a mid-career research scientist for the Naval Research Laboratory (NRL), has been littered with sinkholes and rogue waves, with occasional patches of calm seas and following winds. This poster chronicles my journey from undergraduate studies in terrestrial geology through my graduate work in Marine Sciences, and a few of the more interesting stops on the way to my present position at NRL. Questions to be answered: 1. Did I have a career plan (and how often did it change along the way)? 2. What/who were the major influences on the direction my career has taken? 3. Can you successfully balance work and family in this field? 4. How has the work environment changed in the past 20 years? 5. Is the government a female friendly employer? Suggestions/ideas will be presented on how to support and cultivate female Marine Geological careers and research in the future.

ED71A-0049 0830h INVITED POSTER

Choosing Your Geosciences Career Path

Terri Paluszkiwicz (703-292-8582; tpaluszk@nsf.gov)

Terri Paluszkiwicz, National Science Foundation Ocean Sciences Division 4201 Wilson Blvd., Arlington, VA 22230

There are many possibilities for rewarding careers in the geosciences including positions in academia, government, industry, and other parts of the private sector. How do you choose the right path to meet your goals and needs and find the right career? What are the tradeoffs and strategic moves that you should make at different stages in your career? Some of the pros and cons between soft-money research, government research, and management and industry positions are discussed from a personal perspective. In addition this presentation will provide some perspective on different career choices as seen by program managers in funding agencies. The competing priorities between work life and private life are discussed with the some thoughts on compromising between having it all and finding what works for you.

ED71A-0050 0830h INVITED POSTER

From Supernovae To Equatorial Ionosphere, Following a Tortuous Path Through Computer Sciences, Oceanography, and Much, Much More

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From as early as I can remember, I always wanted to be a scientist. My interests were oriented towards cataclysmic and catastrophic events. I first wanted to study volcanoes, then earthquakes. As I ended my PhD, my interests had gone a little higher, towards supernovae and the Crab Nebula. This was in Paris. I then immigrated to the US. My first job in the US was in computer sciences. I joined a team who made one of the first computer movies. I then switched fields once more. I went into ionospheric physics, where I stayed for more than 2 decades. I then did two tours of duty at National Sciences Foundation. I was first in the Magnetospheric Program. Then I started a multidisciplinary program that covered all sciences related to the arctic - from the bottom of the ocean to the confines of the magnetosphere, passing through biology, glaciology, etc. Presently, I lead a team of about 20 scientists at the Air Force Research Laboratory. We work on basic and applied ionospheric sciences problems as they relate to communications and navigation.

As a woman scientist, the hardest obstacle I had to overcome was probably the permanent guilt of not staying home with my children. I raised 3 boys, and, although they are happy, successful and well adjusted, I continue to feel guilt about not staying home for them, and working so long hours and with so much intensity. When they were small, society was not too accepting of working mothers. In one of my kids first grade class, he was the only child whose mother was working. As a teenager I also had to overcome rejection from boys who could not stand girls who studied science. My own father was not too encouraging to continue studies, warning me that women who are too bright have a hard time finding husbands. One University professor told the class that women were wasting taxpayers money since they would never put their degree to use. My greatest support was my husband, always there, sharing chores, and understanding my ups and downs. The saying that the difficult period in a womans life is only between the ages of 7 and 70 gives me solace. I cant wait to be 70.

ED71B MCC: Hall D Sunday 0830h

Improving Diversity in the Earth and Space Sciences: Programs That Work I Posters (joint with B, OS, P, S, SA, SH, SM, T, V, PA)

Presiding: F R Hall, University of New Orleans; K Grove, San Francisco State University

ED71B-0051 0830h POSTER

Enhancing Diversity in Earth and Space Science

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Interdisciplinary minors and courses have been developed on various CUNY campuses which include topics in physical science, geoscience, environmental science and computer science, as well as the latest developments in the field of Earth Science and Space Science. The objective is to excite students and create interest in Earth and Space Science by integrating an existing NASA and NOAA missions, e.g. SOHO, EOS, Landsat, into the curriculum and by having students use the mission data to either create code for data analysis and/or analyze data. This some courses team taught by physical, geoscience and computer science faculty in the various colleges. The missions becomes the basis for the physical principles and computer applications taught in the course and students are required to complete research projects, working individual at times and in teams. In addition, it is preparing the students for summer research programs at either Goddard Space Flight Center, Goddard Institute for Space Studies, South Carolina State University or on a campus in the City University of New York. Supported by NASA MU-SPIN and NASA Space Science.

ED71B-0052 0830h POSTER

The Space Place: Multifarious Merchandise for Omnifarious Folks

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"The Space Place" is a coordinated NASA educational outreach program that seeks to reach a diverse and under-served audience, including minorities, girls, inner city children, and those living in rural areas. This audience also includes the more than 27 million Americans who, according to the 2000 census, speak Spanish as their first language.

The Space Place began in 1998 with a child-oriented Web site (<http://spaceplace.nasa.gov>) presenting simple "make and do" activities and fun facts related to the technology validation space missions of NASA's New Millennium Program. The Web site is now sponsored by over 30 space science and Earth observing missions. And it is now also available in Spanish.

Having materials available on the internet, however, does not guarantee that everyone in the target audience will have access to them. So, The Space Place went on to create a suite of products and a network of partnerships that would allow more direct and diverse ways to communicate. This was invented Club Space Place.

Club Space Place works through two different types of partnerships: national and local. The products provided: quarterly guides for original Club Space Place group activities, plus NASA space and Earth science and technology bulletin board display materials.

The first of the national organizations participating in Club Space Place was Boys & Girls Clubs of America. With 3100 chapters and 3.3 million members ages 6-18, 67% of whom are minorities, BGCA has been able to distribute the quarterly Space Place activity guides electronically via its Web sites to all chapters that have internet access and by hardcopy to those that don't. Other national organizations that receive the activity guides include YWCA, 21st Century Learning Centers, and Civil Air Patrol.

Local community partners include about 240 museums, libraries, planetariums, zoos, and aquariums, largely in small cities, towns, and rural areas, with a combined annual visitorship of 26 million. These partners receive individual attention. Each receives the Space Place display materials, updated with quarterly mailings and the quarterly activity guides.

Another product is a monthly Space Place newspaper column written for children. This column is currently published in 14 English language newspapers and 7 Spanish language newspapers, with a combined daily circulation of over 2.5 million copies. And, for the target audience that has neither internet nor newspaper access, The Space Place has a toll free phone line (1-866-575-6178) with answers to often-asked questions about space sent in by the community partners. The monthly phone message is also given in Spanish.

Evidence continuously points to the success of The Space Place program at reaching its target audience. Counts of visitors to the Web site continue to grow, as