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## Ogmnius Exchange *Science, Genetically Modified Foods, and the Rumsfeld Doctrine*

**A**s they have for the last



ten years, next spring U.S. farmers will plant more genetically-modified (GM) corn, cotton and soybean seeds. GM crops have been a huge success with farmers: today, more than 80% of the cotton and soybeans grown in the U.S., and over half the corn, are GM varieties. Biotech crops have probably been the most rapidly-adopted agricultural technology in history.

But the biotech revolution has stalled. Today, nearly ten years after the first crops came to market, the same four major GM crops are being grown, with the same two GM traits – pest-resistance and herbicide-tolerance. GM varieties of sugar beets and potatoes have been approved by regulators, but they're not on the market because no one wanted to buy them. Recently, Monsanto announced after years of development that it was shelving GM wheat – in part because wheat farmers weren't sure they wanted it.

What happened?

Biotech's big problem is a nagging concern about the safety of GM foods, especially in the foreign

markets that are the big buyers of U.S. grain and seed products. Marketers are concerned that consumers will simply reject biotech foods and foods with ingredients derived from GM crops. As a result, lucrative export markets in Europe, Japan, and other nations are effectively closed to new GM varieties.

The debate about the safety of biotech foods has been going on unabated for at least 15 years. Biotech advocates argue that companies have done extensive safety testing on GM products. They point to the numerous reports of independent scientific experts, including the National Academy of Sciences, that testify to the safety of biotech foods. They point to the nearly ten years that U.S. consumers have been eating foods derived from GM crops without a "single, solitary example of a sniffle or headache," as one industry spokesman puts it. The lingering fear about the safety of biotech foods drives the biotech industry crazy.

Maybe they should talk to Defense Secretary Donald Rumsfeld.

Rumsfeld famously stated, "[T]here are known knowns; there are the things we know we know. We also know there are known unknowns; that is to say there are some things we do not know. But there are also

## Ogmios Exchange Continued

unknown unknowns – the ones we don’t know we don’t know.”

Biotech’s safety perception problem comes from the “unknown unknowns.” Company scientists know about the new protein that is intended to be expressed in the engineered plant, and they can test it for toxicity and allergenicity. And they know how to look for the “known unknowns”: the unintended genetic changes that can change the known nutritional composition of a food. But the trick is the “unknown unknowns”: how do you begin to look for subtle changes in the thousands of proteins in a typical whole food when you have no idea of what to look for or where to look for it?

It’s the “what if?” question: what if scientists discover something bad twenty years from now? It’s not an altogether unreasonable concern, given the well-publicized stories of once-promising technologies whose flaws became apparent only after widespread use.

The latest GM food report by the National Research Council, *Safety of Genetically Engineered Foods: Approaches to Assessing Unintended Health Effects*, wrestled with this exact question. The NRC panel re-confirmed that there’s nothing uniquely risky about genetic engineering: all breeding techniques carry some risk of creating unintended genetic changes. But after reviewing existing and possible future technologies to screen genetic changes in new foods, the NRC panel concluded that safety has to be assessed on a case-by-case basis and cannot be 100% assured in advance. Among other things, the NRC recommended a better monitoring program to detect any problems that might be caused by the introduction of new foods.

Did this latest attempt to use science to reassure skittish consumers succeed? The biotechnology industry hoped so: one spokesman said, “[T]his report should lay to rest the few naysayers who continue to question the safety of these crops.” Apparently, the naysayers didn’t read the same script. A spokesperson for one group, the Center for Food Safety, said instead that the “NAS report tells us that genetic engineering may cause harmful unexpected changes in our food.”

One of the reasons this debate has proven so intractable is because it assumes that safety is solely a scientific issue. That assumption is misplaced. Science can tell us about risks, but people bring their own set of values to bear in determining whether those risks are acceptable. We willingly take risks every day that would be totally unacceptable in a different context. We don’t think twice about driving to work despite the quantifiable risk of death or injury. The same level of risk

from a nearby toxic waste dump or from contaminated food would be intolerable.

Part of the judgment that people make about risks also depends on their perceptions of benefits. People understand, for example, that drugs may have side effects, but they are willing to accept that risk as a trade-off for the drug’s benefits. But when there are no perceived consumer benefits – as is the case for the biotech foods currently on the market – consumers are likely to be more risk-averse, particularly when they have alternatives they believe are safer.

Obviously, we don’t consciously perform quantitative risk-benefit calculations on the myriad daily uncertainties of life. If we tried, we’d never do anything. As a practical matter, we exercise some simple heuristics. Chief among those is prior experience: if I drove to work safely the last 100 times, chances are pretty good I can do so again today. (Not that this is always a good heuristic: continuing to smoke because it hasn’t killed you yet is probably not the optimal answer from a health perspective.) In public opinion polls on biotech food, for example, public concerns about safety are reduced when people learn that they’ve already been eating it for ten years.

We also rely on trusted proxies. They could be neighbors, media, public interest groups or the family doctor – sources that have proven in the past to provide trustworthy advice. On food safety issues, the food industry isn’t highly credible: consumers recognize that companies want to sell their products. In the U.S., the most trusted source of information about food safety turns out to be the government, particularly the FDA. In contrast, European consumers have little trust in their governments in the wake of the “mad cow” debacle, where governments initially tried to reassure consumers that there were no risks in eating meat – and then later had to admit there were.

The lack of prior experience with biotech foods, combined with the perceived lack of benefit and the absence of any trusted proxy on the safety issue, has led to the current skepticism about safety and hostility toward biotech foods in Europe and other parts of the world. More assurances from scientists that such concerns are misplaced are unlikely to change the dynamic. Fears about the “unknown unknowns” can be overcome only through experience and trust, neither of which can be earned overnight.

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## Research Highlight

### *Climate Services Clearinghouse*

**T**his month's Research Highlight features the work of Genevieve Maricle, an Environmental Studies and Center graduate student. This column will describe her work in further detail, but in sum she seeks to create an interface with which to successfully transfer climate research to useful products for decision makers.



#### The Problem

Knowledge of climate on spatial and temporal scales of relevance to decision makers has advanced dramatically in recent decades, and consequently has fostered the proliferation of a wide range of climate products and services geared toward the needs of decision makers. And yet recent research indicates that many farmers, water managers, highway administrators, and others do not currently consider potentially useful climate products in their planning decisions. Thus there is a gap between the supply of and demand for climate information.

But in this gap lies an opportunity to establish a formal and efficient mechanism to transfer research and products to decision makers. However, this opportunity cannot be realized without a comprehensive perspective of the scope of available climate services. And at present, no one has this comprehensive perspective.

#### The Project

Consequently Genevieve has developed the Climate Services

Clearinghouse (CSC), which seeks to provide a single point-of-access to the entire scope of climate services. It is a robust, online, searchable database of all contemporary climate services from across public, private, and non-governmental sectors. Additionally, by soliciting information from on-going focus groups, the CSC will serve as an intermediary between climate researchers and decision makers in order to contribute to focusing climate research and operational transition activities on the needs of stakeholders.

Ultimately the CSC aims to provide both decision makers and climate researchers with the perspective necessary to facilitate

- a) the transfer of research into useful products
- b) the connections of user needs with the process of setting research priorities, and
- c) the evaluation of climate research already underway.

Once fully established, we hope to transfer the CSC into an operational setting at the National Weather Service Climate Services Division. In so doing, the CSC will become one of a suite of climate services tools both for those who produce climate services and those who use, or could use, climate services.

Version 1.0 of the Climate Services Clearinghouse (<http://sciencepolicy.colorado.edu/climateservices/>) is now online. Comments are welcome!

Genevieve Maricle  
[Genevieve.maricle@colorado.edu](mailto:Genevieve.maricle@colorado.edu)

## Project News

### *Lisa Dilling Joins Center, Brings New Projects*

**L**isa Dilling recently joined the Center as a CIRES Visiting Fellow. Lisa, whose research focuses on the use of information in decision making related to climate and, in particular, the carbon cycle, brings the following projects to the Center:

*Scales of Decision-Making and the Carbon Cycle* ([http://sciencepolicy.colorado.edu/homepages/lisa\\_dilling/ccycledecisions/](http://sciencepolicy.colorado.edu/homepages/lisa_dilling/ccycledecisions/)) will be the first step in understanding how decisions made in institutions at different scales currently act to affect carbon sequestration.

*State of the Carbon Cycle Report* (<http://www.isse.ucar.edu/soccr/>) is a broadly conceived activity “designed to provide accurate, unbiased, and policy-relevant scientific information concerning the carbon cycle to a broad range of stakeholders.”

The two overarching objectives for the SOCCR are to summarize scientific knowledge about carbon cycle properties and changes; and to provide scientific information for decision support and policy formulation concerning carbon.

*Communicating Urgency, Facilitating Social Change: New Strategies for Climate Change* (<http://www.esig.ucar.edu/changeworkshop/index.html>). The focus of this project is how to improve climate change communication in a way that helps facilitate individual and organizational/institutional change toward more environmentally sustainable behavior.

Lisa is also a key participant in the Center's Carbon Cycle Science (<http://sciencepolicy.colorado.edu/carboncycle/>) and Science Policy Assessment and Research on Climate projects.

## Project News

### *Conversations with Presidential Science Advisors*

**O**n issues as diverse as stem cell research

and aluminum tubes in Iraq, science has

occupied the center of a number of highly visible debates in recent years. To gain perspective on the role of science in policy and politics at the highest levels of government, the CIRES Center for Science and Technology Policy Research at the University of Colorado-Boulder is sponsoring a lecture series featuring the current and former presidential science advisors. The theme of the lecture series is "Policy, Politics, and Science in the White House: Conversations with Presidential Science Advisors." Through this series we seek to document how science is used and perhaps sometimes misused in policy and politics. Using an interview format we will articulate the theme by discussing with each presidential science advisor a significant science policy issue or issues that arose during his tenure.

Participants are:

- Dr. John H. Marburger II (President George W. Bush 2001-present)



- Dr. Neal Lane (President Bill Clinton 1998-2001)
- Dr. John H. Gibbons (President Bill Clinton 1993-1998)
- Dr. D. Allan Bromley (President George H.W. Bush 1989-1993)
- Dr. George A. Keyworth II (President Ronald Reagan 1981-1986)
- Dr. Edward David (President Richard Nixon 1970-1973)

The series will run throughout calendar year 2005. Sponsors include the Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado-Boulder Graduate School and Office of the Vice Chancellor for Research, University of Colorado-Boulder Provost's Office, University of Colorado-Boulder College of Engineering and Applied Science, University of Colorado-Boulder College of Arts and Sciences, Dean's Fund for Excellence, ICAT Managers, Inc., and Southwest Research Institute.

The Center's Presidential Science Advisor's website will be updated throughout the series. For more information about the series, please see

<http://sciencepolicy.colorado.edu/scienceadvisors>.

## Project News

### *Carbon Cycle Science Project*

**H**ow might carbon cycle research under the US Global Change Research Program (i.e., the "supply" of carbon cycle science) more effectively and efficiently address the needs and capabilities of actual or potential decision makers who use carbon cycle science (i.e., the "demand" for carbon cycle science)?



In order to answer this question, we are mapping the production of carbon cycle science, from the needs of those who make decisions to the scientists and agencies that supply scientific information and then back to the decision makers who might use the information ("reconciling supply and demand"). Our goal is to contribute to the effectiveness of both carbon cycle research and decision making related to the carbon cycle.

On September 16-17, 2004 about 35 people convened for a workshop at the Natural Resource Ecology Laboratory in Fort Collins, Colorado to discuss reconciliation of supply of and

demand (RSD) for carbon cycle science. Participants included carbon cycle scientists, program managers, social and policy scientists, people who make decisions implicated by carbon cycle science, as well as a number of graduate students. The workshop focused on characterizing supply, understanding demand, and learning lessons from other areas of research where RSD has been an important component of science policy (e.g., seasonal climate forecasting). The workshop focused closely on three cases in which to explore RSD in some detail: agro-ecosystems, the urban setting, and an international case study focused on the Large-Scale Biosphere Atmosphere Program in the Amazon. Six background papers were commissioned for the workshop focused on the methods and literature of RSD, a big-picture characterization and history of carbon cycle science, and on each of the case studies.

A workshop report will be available soon and can be found at the Carbon Cycle project website (<http://sciencepolicy.colorado.edu/carboncycle/>).

## Project News

### *Science Policy Assessment and Research on Climate*

**T**he Center's new NSF project, Science Policy Assessment and Research on Climate (SPARC), is



up and running. Please see our Center's website (<http://sciencepolicy.colorado.edu>) for further details on SPARC.

Our next issue of Ogmios will contain a focus on SPARC activities.

## Project News

### *The Klamath Basin Project*

**T**hird year law student Anne Ruggles worked at the Center as an extern

exploring the role of science and policy in the Klamath Basin. The culmination of her research can be found at the recently redesigned Klamath Basin Project



website (<http://sciencepolicy.colorado.edu/klamathbasin/>).

This website explains the physical, historical, legal, and stakeholder contexts in the Klamath, discusses the 2001 controversy and includes links to key reports, explores the link between science and policy, and provides information about several alternative solutions that have been proposed to resolve the controversy.

## Project News

### *Hurricane risk pricing, catastrophe models, and data quality*

**F**ormer ENVS graduate student Edouard von Herberstein

undertook this project entitled "Hurricane risk pricing, catastrophe models, and data quality: Why it matters and what should be



done about it?" to propose a method to assess the sensitivity of insurance pricing methods to data quality. He questions whether these pricing techniques efficiently use the information in hurricane loss models. His report can be found here ([http://sciencepolicy.colorado.edu/homepages/edouard\\_h/hurricane\\_risk\\_pricing/](http://sciencepolicy.colorado.edu/homepages/edouard_h/hurricane_risk_pricing/)). Edouard now works for Wellington in London.

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[ogmios-admin@sciencepolicy.colorado.edu](mailto:ogmios-admin@sciencepolicy.colorado.edu)

and include the following information:

- Name
- Email Address
- How you heard about Ogmios
- Organization
- Interests & Needs



## Center News

### *Comings and Goings*

**S**enior Research Associate Subhrendu Gangopadhyay joined Hydrosphere, a Boulder, Colorado-based hydrology consulting firm. We wish Subhrendu the best of luck in his new venture!



Former Center graduate student Jessica Lang-Lowery received her Masters in Environmental Studies in May 2004. She is now working with

the Western Water Assessment to try and understand the current and future informational needs of local water managers. She hopes to help WWA researchers translate those needs into useful products and services.

Former Center graduate student Edouard von Herberstein received his Masters in Environmental Studies in May 2004 and is now working for Wellington in London.



## Center News

### *2003-04 Annual Report*

**T**he Center's 2003-04 Annual Report is available online ([http://sciencepolicy.colorado.edu/center\\_info/archives/annual\\_report\\_03-04.pdf](http://sciencepolicy.colorado.edu/center_info/archives/annual_report_03-04.pdf)) or in hard copy. The report highlights new projects at the Center and educational and outreach efforts, and includes

listings of students, staff, affiliates, and visitors/collaborators, and a copy of the Center's recently completed strategic plan.

To obtain a hard copy please contact Ami Nacu-Schmidt at 303-735-0451 or [ami@cires.colorado.edu](mailto:ami@cires.colorado.edu).

## Student News

### *Center Welcomes Shali Mohleji*

**T**he Center welcomes Shali Mohleji, a new graduate student in Environmental Studies, to its ranks. Shali is a first year doctoral student interested in connecting the atmospheric sciences and policy fields together. Her background is in atmospheric sciences academically, and related to policy from her work experience.



Shali has a Bachelor's Degree from the University of Virginia

in Environmental Sciences with a concentration in Atmospheric Sciences. She received a Master's Degree in Atmospheric Sciences at Purdue. Afterwards she worked for an environmental consulting firm dealing mostly with air pollution and air quality in the Midwest. She also worked on ISO 14001 and environmental management projects. The combination of these different types of projects sparked her interest in corporate environmental ventures as well as policy issues.

## Student News

### *Shep Ryen Discusses Hubble Space Telescope*

**E**nvironmental Studies Ph.D. candidate and Center graduate student Shep Ryen gave a talk at the Center's October 11 Noontime Seminar Series titled "Deciding the fate of the Hubble Space Telescope." Shep's Powerpoint presentation is available online at ([http://sciencepolicy.colorado.edu/%7Eami/annextra/ryen\\_presentation.pdf](http://sciencepolicy.colorado.edu/%7Eami/annextra/ryen_presentation.pdf)).

Please note: Our Speakers page at (<http://>



[sciencepolicy.colorado.edu/center\\_info/center\\_talks.html](http://sciencepolicy.colorado.edu/center_info/center_talks.html)) includes all past and future speakers, dates and titles of their talks, and their PowerPoint presentations, if available.

## Student News

### *Joel Gratz's NWS Project Has New Website*

**J**oel Gratz's project, "Lessons in Technology Transfer Policy for the Atmospheric Sciences: A case study in Public-Private-Academic Partnership on Level II Radar Data" proposes to evaluate the policy processes and outcomes related to the partnership on Level II radar data.

Joel is a graduate student at the University of Colorado enrolled in the joint Environmental Studies M.S. program and MBA program. To learn more about this project, please see its website, ([http://sciencepolicy.colorado.edu/homepages/joel\\_gratz/ltt/as/index.html](http://sciencepolicy.colorado.edu/homepages/joel_gratz/ltt/as/index.html)).

## Student News

### *Elizabeth McNie Presents Paper at Carbon Cycle Workshop*

**E**lizabeth McNie's research focuses on how to reconcile the supply of and demand for scientific information between scientists and decision makers. Part of her research involved an extensive literature review in which she analyzed the problems of reconciliation and how science is used in the decision making process. She found the use of 'boundary organizations' to be one of the more promising mechanisms by which to connect science and policy; to ensure the salience and credibility of the information and to ensure that the science produced is useful to decision makers. She recently presented her paper at the

'Carbon Cycle Science: Reconciling Supply and Demand Workshop' in Fort Collins, CO and at the 'Monitoring Science and Technology Symposium: Unifying Knowledge for Sustainable Development in the Western Hemisphere' in Denver, where she also spoke during the closing plenary. She is a third year Ph.D. student in Environmental Studies at the University of Colorado-Boulder.



For more information, please see the project's website at: <http://sciencepolicy.colorado.edu/carboncycle/>.

## Student News

### *Adam Briggles Presents Paper at Sustainability Conference*

**A**dam Briggles recently attended the EFS West Sustainability and Higher Education Conference in Portland, Oregon (October 21-23). He presented a paper in progress entitled, "Sustainability as a Human Science," in which he argues that sustainability requires knowledge about the natural (the proper place for humans in nature) just as it requires scientific knowledge about nature. Thus, he contends that an education for sustainability ought to include the integration of the humanities with the sciences in problem-oriented learning formats. Adam also presented a poster entitled, "Humanities Policy: Expanding Knowledge for Decision Making." This

builds off of his ongoing work as the director of Humanities Policy Central (<http://humanitiespolicy.unt.edu>). This website serves as a clearinghouse for resources about the integration of values and science to improve decision making. It also seeks to cultivate a community of educators and researchers working at the interface of the humanities, sciences, and society. In his spare time, Adam has been writing and editing articles for the *Encyclopedia of Science, Technology, and Ethics*, which Macmillan Reference will publish. Adam is a Ph.D. candidate in Environmental Studies at the University of Colorado-Boulder.

## Recent Center Publications

Clark, M, L. Hay, A. Slater, K. Werner, D. Brandon, A. Barrett, S. Gangopadhyay, and B. Rajagopalan, 2004. Ensemble Streamflow Forecasting in Snowmelt Dominated River Basins. GEWEX News, p. 4-6, August, <http://www.gewex.org/Aug2004.pdf>.

Gratz, J., 2004: Vorticity or Veteran's Affairs? The Washington, D.C. Perspective on Meteorology from the Eyes

of a Graduate Student. Bull. Amer. Met. Soc. v. 85 n. 11, November, [http://sciencepolicy.colorado.edu/admin/announcement\\_files/announcement-524.pdf](http://sciencepolicy.colorado.edu/admin/announcement_files/announcement-524.pdf).

Pielke, Jr., R.A., 2004. The End of Research? A Perspective for the Consortium for Science, Policy, and Outcomes, Arizona State University, October, [http://www.cspo.org/ourlibrary/perspectives/Pielke\\_October04.htm](http://www.cspo.org/ourlibrary/perspectives/Pielke_October04.htm).

## Center Talks and Presentations

The Center continues its emerging tradition of hosting regular “noontime seminars” as an opportunity for Center staff, students, and affiliates to share research in an informal setting. We also sponsor other “occasional seminars” by CU students and staff not affiliated with the Center, as well as guest speakers from outside the university.

Please visit the Center’s speaker’s page ([http://sciencepolicy.colorado.edu/center\\_info/center\\_talks.html#](http://sciencepolicy.colorado.edu/center_info/center_talks.html#)) for lists of upcoming talks, details about speakers, abstracts, and, frequently, copies of their Powerpoint presentations.

### Fall 2004 Talks

September 22: Craig Roseberry, U.S. Army and CU graduate student, "Army Space Policy: History, Organization, and Future." Craig’s Powerpoint can be found at: [http://sciencepolicy.colorado.edu/%7Eami/annextra/roseberry\\_presentation.pdf](http://sciencepolicy.colorado.edu/%7Eami/annextra/roseberry_presentation.pdf).



September 23: Dr. K. Mark Leek, co-director of the Institute for Global and Regional Security Studies of the Pacific Northwest National Laboratory, "Overview of the Institute for Global and Regional Security Studies (IGRSS) and Nonproliferation Graduate Program (NGP)".

October 11: Shep Ryen, ENVIS Ph.D. student, “Deciding the

fate of the Hubble Space Telescope." Shep’s Powerpoint can be found at: [http://sciencepolicy.colorado.edu/admin/announcement\\_files/announcement-371.pdf](http://sciencepolicy.colorado.edu/admin/announcement_files/announcement-371.pdf).

November 1: Bob Frodeman, Chair, University of North Texas Philosophy Department and Center Affiliate, "Humanities Policy: What it is, and why it's needed."

December 6: Tom Yulsman, Associate Professor, CU School of Journalism, "What makes news in science?"



### Talks Scheduled for Spring 2005

February 7: Joel Gratz, 12:30 - 1:30pm, Environmental Studies Graduate Student, “Commercializing Research: My summer experience at the CU Technology Transfer Office”.

March 7: Susan Avery, 12:00pm - 1:00pm, Dean Of Graduate School And Vice Chancellor For Research, “Scientists Pushing Back”.

April 4: Frank Laird, 12:00pm - 1:00pm, Technology & Public Policy, Grad School of Int’l Studies, Univ. of Denver, Topic to be announced.

April 18: Lisa Keranen, 12:00pm - 1:00pm, Department of Communication, University of Colorado, “Constructing Character in Research Misconduct Controversies”.

All talks are open to the public and held in the conference room at the Center for Science and Technology Policy. For a map, please see: [http://sciencepolicy.colorado.edu/center\\_info/find\\_us.html](http://sciencepolicy.colorado.edu/center_info/find_us.html).

## Upcoming Center Events

### *Science, Technology, and Decision Making Symposium*

The Center will host a symposium on Science, Technology, and Decision Making at the CIRES Auditorium on the University of Colorado Campus Friday, February 25, from 8:30 am - 4:00 pm.

The day-long symposium will feature approximately 20 short presentations from faculty, researchers, and graduate students on the University of Colorado campus who are affiliated with the Center. It will include a diverse and interesting assortment of topics ranging from homeland security to presidents and the politicization of science to climate services to technology transfer. The symposium will be geared toward

a general audience and is free and open to the public.

The goal of the event is to provide a forum and opportunity for the University community to become more familiar with the diversity of and excellence in research on science, technology and decision making that we have here at CU centered on the CIRES Policy Center.

For directions to the CIRES auditorium, please see: <http://cires.colorado.edu/about/contact/directions.html>.

For additional questions, please contact Ami Nacu-Schmidt, [ami@cires.colorado.edu](mailto:ami@cires.colorado.edu).



## Opportunities *Resources for Job Seekers*

**J**ob opportunities in the science and technology policy field may be limited. The Center provides the following resources to aid job seekers in their quest:

- Each issue of Ogmios ([http://sciencepolicy.colorado.edu/ogmios/archives/issue\\_9/index.html](http://sciencepolicy.colorado.edu/ogmios/archives/issue_9/index.html)) includes job listings.
- The Center's weblog, Prometheus, has a job announcement section ([http://sciencepolicy.colorado.edu/prometheus/archives/job\\_announcements/index.html](http://sciencepolicy.colorado.edu/prometheus/archives/job_announcements/index.html)).
- The Center's website includes links to pages with Science and Technology Policy jobs, internships, fellowships, etc. ([http://sciencepolicy.colorado.edu/sp\\_grads/opportunities.html](http://sciencepolicy.colorado.edu/sp_grads/opportunities.html)).

## Opportunities *Graduate Fellowship Program*

### **The Christine Mirzayan Science & Technology Policy Graduate Fellowship Program**

**T**he Christine Mirzayan Science & Technology Policy Graduate Fellowship Program of the National Academies is designed to engage graduate science, engineering, medical, veterinary, business, and law students in the analysis that informs the creation of science and technology policy and to familiarize them with the

interactions of science, technology, and government. As a result, students develop essential skills different from those attained in academia and make the transition from being a graduate student to a professional. The deadline for receipt of materials is March 1 for the June program; and June 1 for the September program. For more information visit the fellowship website (<http://www7.nationalacademies.org/policyfellows/index.html>).

## Opportunities *Consortium for Science, Policy, and Outcomes*

**T**he Consortium for Science, Policy, and Outcomes (CSPO) at Arizona State University (ASU) seeks a Post-doctoral Research Associate and a Graduate Research Assistant to assist with an NSF-sponsored 5-year joint project with the Center for Science and Technology Policy Research at the University of Colorado. The project, called Science Policy Assessment and Research on Climate (SPARC), will investigate the relation between science policy and climate policy decisions from two perspectives. First, SPARC explores how climate research agendas are developed and implemented, with a particular focus on understanding how the organization of climate research ("supply") relates to the information needs of climate policy decision makers ("demand"). Second, SPARC investigates the relative magnitude of various sources of global environmental change in order to better understand the relation between the causes of global change and the priorities of the U.S. climate science portfolio. Key, cross-cutting themes in each of these efforts include the role and behavior of science policy institutions and



the influence of ethics and values on science policy decisions.

*The initial deadline is December 15, 2004; if not filled every two weeks until the search is closed.*

To find out more about the **Post-doctoral Research Associate position** at CSPO please see: <http://www.cspo.org/home/jobs/postdoc.htm>.

To find out more about the **Graduate Research Assistant position** at CSPO please see: <http://www.cspo.org/home/jobs/gra.htm>.

The Center for Science and Technology Policy Research will also have two graduate research assistant (GRA) positions available this fall to work with the SPARC project. Details about these positions will be provided in the next issue of Ogmios, as well as on the Center's website at: <http://sciencepolicy.colorado.edu>.

## S&T News

### *Science & Technology in Society: An Interdisciplinary Graduate Student Conference*

#### THE CENTER FOR INTERNATIONAL SCIENCE AND TECHNOLOGY POLICY THE ELLIOTT SCHOOL OF INTERNATIONAL AFFAIRS

**T**his annual conference provides a forum for ideas on theory and application of science and technology (S&T) as components of global society. Graduate students from a variety of disciplinary and interdisciplinary programs are invited to present their research on S&T in contexts ranging from local to global, public to private, micro- to macro-scale, speculative to legal, and history to future. In addition to presenting papers, students will have the opportunity to interact with each other and prominent scholars and professionals related to their field (s) of interest. Previous speakers have included Daniel Kleinman, Sandra Harding, and Al Tiech, just to name a few. We expect to draw scholars of similar caliber for the upcoming conference.

The conference organizing committee welcomes submissions of abstracts (up to 250 words) for a 10-15 minute presentation. Abstracts need to be submitted via email to [stglobal@vt.edu](mailto:stglobal@vt.edu) by January 31st, 2005. Acceptance of abstracts will be given by March 1st, 2005. Final papers will potentially be included on the conference website. We seek submissions from graduate students studying topics related, but not limited to the role of S&T in the following thematic areas:

Globalization, International Regulation  
Environment, Biodiversity and Sustainable Development  
The Knowledge-Based Economy

Civil, Ethical and Legal Issues  
National Security and Defense Applications  
Government, Private and Academic Investment  
S&T in Non-Western Cultures  
Historical and Social Dimensions of S&T  
Revolutionary or Non-Traditional Directions in S&T  
Network and Industrial Organization  
Biotechnology  
Policy Implications of S&T  
Information Technology  
Foresight/Forecast in S&T  
Technology and Human Development  
Nanotechnology

Information concerning area lodging and registration will be made available on the conference website by January 31, 2005. Travel funds are available for a limited number of presenters. Students in need of travel funds should indicate so when submitting their abstract. For further information, please visit the conference website at: <http://www2.gwu.edu/~cistp/stglobal/text>.

Sponsored by:  
The National Science Foundation  
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The George Washington University  
Virginia Polytechnic Institute

**When:** April 23rd – 24th, 2005  
**Where:** American Association for the Advancement of Science Headquarters, Washington, DC  
**Abstract Deadline:** January 31st, 2005

## Center Staff in the News

- Roger Pielke, Jr. was quoted in the December 1, 2004 issue of the Daily Camera in an article on the Conference of Parties to the Framework Convention on Climate Change titled "Locals head to climate summit; Adapting to warming will be part of the discussion," by Todd Neff. To read the article, please see: [http://www.dailycamera.com/bdc/science/article/0,1713,BDC\\_2432\\_3365992,00.html](http://www.dailycamera.com/bdc/science/article/0,1713,BDC_2432_3365992,00.html) (free registration required).
- On October 22, 2004 Roger Pielke, Jr. was interviewed on Pacifica Radio about Russia's ratification of the Kyoto Protocol. To read a transcript of the show, please go to: [http://www.pacifica.org/programs/fsrn/fsrn\\_041022.html](http://www.pacifica.org/programs/fsrn/fsrn_041022.html).
- Roger Pielke, Jr. was quoted in the October 24, 2004 issue of the Boulder Daily Camera article on green issues and the presidency. See: [http://www.dailycamera.com/bdc/dc\\_election/article/0,1713,BDC\\_11917\\_3278011,00.html](http://www.dailycamera.com/bdc/dc_election/article/0,1713,BDC_11917_3278011,00.html) (free registration required).

## Science and Technology Policy Resources

**F**rom time to time Ogmios will include S&T policy resources. In this edition we feature S&T policy educational programs and resources.



### Science and technology policy related programs at the University of Colorado:

- Environmental Sociology (<http://socsci.colorado.edu/SOC/Graduate/envsoc.html>)
- Environmental Studies (undergraduate and graduate) (<http://www.colorado.edu/envirostudies/>)
- Graduate Certificate in Environmental Policy (<http://www.colorado.edu/EnvironmentalPolicyCertificate/>)
- Graduate Certificate in Science and Technology Policy (<http://sciencepolicy.colorado.edu/stcert/>)
- Interdisciplinary Telecommunications (<http://itp.colorado.edu/>)
- Public Policy Program (<http://www.colorado.edu/PoliticalScience/PublicPolicyMA/broch96.html>)

### Other science and technology policy educational programs and resources:

- AAAS Guide to Graduate Education in Science, Engineering and Public Policy (<http://www.aaas.org/spp/sepp/index.htm>)
- Carnegie Mellon Engineering and Public Policy Program (<http://www.epp.cmu.edu/>)
- George Washington University M.A. Program in Science, Technology, and Public Policy (<http://www2.gwu.edu/~cistp/index1.html>)
- Georgia Institute of Technology School of Public Policy (<http://www.spp.gatech.edu/spp/jsp/index.jsp>)
- Harvard University Science, Technology, & Public Policy Program (<http://bcsia.ksg.harvard.edu/?program=STPP>)
- MIT Technology and Policy Program (<http://tppserver.mit.edu/index.php3?idnum=1>)
- Princeton Program in Science, Technology and Environmental Policy (<http://www.wws.princeton.edu/%7Estep/>)

- Professional Science Masters (<http://www.sciencemasters.com/index.html>)
- Syracuse Center for Technology and Information Policy (<http://www.maxwell.syr.edu/ctip/ctip.htm>)
- University of Alaska Fairbanks Graduate Program in Regional Resilience and Adaptation, Interdisciplinary Graduate Education and Research Training (IGERT) Program (<http://www.rap.uaf.edu/>)
- University of Arizona School of Law Certificate in Law, Science, and Technology (<http://www.law.asu.edu/?id=8284>)
- University of Delaware Ph.D. in Technology, Environment and Society (<http://ceep.udel.edu/ceep.html>)
- University of Oklahoma Institute for Science and Public Policy (<http://sec.ou.edu/ispp.main.php>)
- University of Minnesota Masters in Science, Technology, and Environmental Policy (<http://www.hhh.umn.edu/academics/gradprograms/ms/index.htm>)
- Washington University Department of Engineering and Policy (<http://students.cec.wustl.edu/~ep/>)

### Science and Technology Studies programs

- CalTech Science, Ethics, and Society program (<http://www.hss.caltech.edu/humanities/ses/grad>)
- Claremont College Science, Technology, and Society program ([http://www2.hmc.edu/www\\_common/sts/stswelc.html](http://www2.hmc.edu/www_common/sts/stswelc.html))
- Cornell University Department of Science and Technology Studies (<http://www.sts.cornell.edu/>)
- New Jersey Institute of Technology Science, Technology, and Society program (<http://www.njit.edu/old/njit/catalog/undergraduate/91/24-und.html>)
- North Carolina State University Program on Science, Technology, & Society (<http://www.ncsu.edu/chass/mds/psts.html>)
- Rensselaer Polytechnic Institute (<http://www.rpi.edu/dept/sts/>)
- Virginia Tech (<http://www.nvgc.vt.edu/sts/>)

If you would like to suggest an addition to this list, please contact Ami Nacu-Schmidt at [ami@cires.colorado.edu](mailto:ami@cires.colorado.edu).

## About Us

Ogmios is the newsletter of the Center for Science and Technology Policy Research which is published four times a year. The Center is within the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado-Boulder. The mission of CIRES, which was established in 1967, is to act as a national resource for multidisciplinary research and education in the environmental sciences. CIRES is jointly sponsored by the University of Colorado-Boulder and the National Oceanic and Atmospheric Administration.

### On-Line Version

(<http://sciencepolicy.colorado.edu/ogmios/>)

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