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for a Sustainable Future

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ANNOUNCEMENT

Academic Venture Fund Awards

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The Atkinson Center for a Sustainable Future (ACSF) announces its spring 2011 **Academic Venture Fund** awards. Initiated in 2008, this fund is designed to stimulate original, cross-disciplinary research at Cornell in sustainability science, emphasizing work having the potential to involve external partners such as industry, government, foundations, and NGOs. The 33 proposals submitted in response to the latest AVF solicitation represent a vibrant, innovative, and interdisciplinary movement at Cornell.

Nearly 80 percent of the proposals included investigators from more than one college or school and 70 percent of them encompassed two or more of the Center's sustainability themes of **energy, environment, and economic development**.

Researchers from the Engineering and Agriculture and Life Sciences colleges were well represented, often in multidisciplinary teams. This round of proposals also included investigators from the colleges of Human Ecology; Art, Architecture, and Planning; Arts and Sciences; Veterinary Medicine; the Cornell Law School; Faculty of Computing and Information Science; and the Johnson Graduate School of Management. Over 30 percent of the proposals included faculty from three or more colleges or schools.

To evaluate the submissions, the center convened three review panels, each composed of distinguished faculty from across the university. Each proposal received at least three written reviews, in addition to a panel review. The ranked funding recommendations of the three panels were reviewed by the ACSF leadership team and final award decisions were based on the reviews and available funding. Ten proposals were selected for total funding of \$662,509 in this round of the AVF. Many more promising proposals were submitted than could be funded; there are plans for another round of AVF awards next year.

The Cornell Center for a Sustainable Future was created in the fall of 2007 by the Office of the Provost. Renamed in October, 2010 in honor of David and Patricia Atkinson, the center advances multidisciplinary research and cultivates innovative collaborations within and beyond Cornell to foster a sustainable future for all.

To learn more about the Atkinson Center, please visit our website at www.acsf.cornell.edu/. You will find information about the AVF awards made in previous years at www.acsf.cornell.edu/AVF/.

New Sales Approach for Improved Cookstoves



Half the world cooks on inefficient wood and charcoal stoves. The stoves create indoor air pollution that kills more than a million children each year, and their inefficient use of fuel contributes to deforestation and global climate change. Improved cookstoves can reduce these problems and save households the substantial cost of buying or gathering fuel, yet the global poor have not widely adopted cleaner-burning stoves. In a pilot program in Uganda, Garrick Blalock (AEM), Johannes Lehmann (CSS), and Parfait Eloundou-Enyegue (DSOC) will

test a novel stove sales approach—essentially rent-to-own—that offers a free trial period and financing through fuel savings to increase dramatically local adoption of more efficient stoves.

Investigators: Garrick Blalock (AEM), Parfait Eloundou-Enyegue (DSOC), and Johannes Lehmann (CSS)

Funding: \$38,000

Duration: 12 months

Threats to Biodiversity and Ecosystem Services in the Finger Lakes



The Finger Lakes region's native plant and animal life are threatened by climate change, energy development, and the spread of invasive species. Large populations of white-tailed deer continue to transform even protected areas in parks and preserves into ecological disaster zones. Bernd Blossey (NTRES), John Fitzpatrick (LABO), Paul Curtis (NTRES), Eric Nelson (PLPA), and Kelly Zamudio (EEB) will create a network of two-hectare deer exclosures on private and public lands to assess deer impacts on plants, birds, amphibians,

invertebrates, and microbial communities. Collaborating with citizens, communities, and management agencies, the Cornell research team will deliver an accurate assessment of deer impacts on local biota that will support a new era of enlightened ecosystem management.

Investigators: Bernd Blossey (NTRES), Paul Curtis (NTRES), John Fitzpatrick (LABO), Eric Nelson (PLPA), and Kelly Zamudio (EEB)

Funding: \$100,104

Duration: 16 months

Developing a Sustainable Specialty Crop Greenhouse Industry in the Northeast



Most experts consider year-round, soil-based greenhouse production of specialty crops in the northeastern United States impractical, primarily due to comparatively high energy and labor costs. In partnership with the Stone Barns Center for Food and Agriculture, Miguel Gómez (AEM), Huaizhu Gao (CEE), and David de Villiers (BEE) will develop optimization models for a year-round greenhouse operation growing more than 50 high-value specialty vegetables, identifying production and commercialization systems that maximize profits and

minimize greenhouse gas emissions and energy use. The research will challenge accepted wisdom on agriculture in our region, offering an integrated approach to production practices, energy use, and market access with the potential to lead to a new sustainable greenhouse industry for the Northeast.

Investigators: Miguel Gómez (AEM), David de Villiers (BEE), and Huaizhu Gao (CEE)

Funding: \$39,003

Duration: 12 months

Harnessing Genomics to Advance Biodiversity and Conservation Research



Comparative genomics has revolutionized genetic analysis in model taxa with full reference genome sequences—species now including human, mouse, and fruit fly. Harnessing these advances for application to natural populations of organisms will transform conservation biology by providing methods for analyzing adaptive variation across environments and enabling management strategies that increase functional diversity. Led by Matthew Hare (NTRES), Kelly Zamudio (EEB), Ian Hewson (BIOMI), and Alexander Travis (VTBIO),

this project will improve the efficiency of genomic algorithms for applications beyond the fully sequenced species. While completing two case studies that stretch conventional genomic methods to serve conservation goals, the group will also promote interactions among biodiversity and conservation scientists and traditional model-system genomicists at Cornell.

Investigators: Matthew Hare (NTRES), Ian Hewson (BIOMI), Alexander Travis (VTBIO), and Kelly Zamudio (EEB)

Funding: \$71,884

Duration: 12 months

Sustainable Disease Management for Emerging Bioenergy Crops



Researchers are currently testing promising biofuels feedstocks, such as willow and switchgrass, to be cultivated in the eastern United States. A successful biofuel industry in this region will require sustainable, integrative disease management for plant pathogens that could threaten expected yields. George Hudler (PLPA), Gary Bergstrom (PLPA), Kathie Hodge (PLPA), and Lawrence Smart (HORT) will use DNA data to identify geographically separate populations of fungi affecting bioenergy crops and determine the genetic

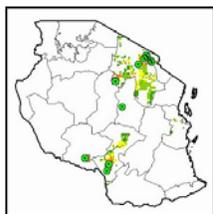
diversity within populations of each fungus. This research will set a foundation for effective management of leaf pathogens on which scientists in mycology, plant pathology and breeding, and feedstock production can build—ensuring predictable futures for feedstock crops and improving economic returns for these crucial bioenergy resources.

Investigators: George Hudler (PLPA), Gary Bergstrom (PLPA), Kathie Hodge (PLPA), and Lawrence Smart (HORT)

Funding: \$64,240

Duration: 15 months

Property Formalization and the Role of Technology in Tanzania



Tanzania is currently implementing a Property and Business Formalization Program intended to transform informal property and businesses into legally held and majority-operated entities in the formal sector of the economy. Taking Tanzania as a case study, Stephan Schmidt (CRP) and Eduardo Penalver (LAW) will examine the potential of and obstacles to using geographic information systems (GIS) in formalizing and incorporating customary tenure. The research will investigate ways for the government to use GIS in a rapidly urbanizing area

without secure land tenure, address a major criticism of property formalization—that it fails to acknowledge the different principles and relationships that underpin informal, extralegal property systems—and, more broadly, explore the role of technology in international development.

Investigators: Stephan Schmidt (CRP) and Eduardo Penalver (LAW)

Funding: \$13,872

Duration: 12 months

Methane Production in Natural Gas Extraction from Shale



Natural gas is commonly extracted from shale, yet the total greenhouse gas footprint of shale-derived gas is unknown—and may be greater than conventional gas—due to uncertainty about the fugitive emission of methane. Methane is a far more potent greenhouse gas than carbon dioxide, but it is also removed more rapidly from the atmosphere. Led by Jed Sparks (EEB), Anthony Ingraffea (CEE), Natalie Mahowald (EAS), Robert Howarth (EEB), and Antonio Bento (AEM), this project will quantify the methane released by shale gas

development and reassess the global methane budget. The findings will have important economic ramifications for a carbon tax or any system of carbon exchange.

Investigators: Jed Sparks (EEB), Antonio Bento (AEM), Robert Howarth (EEB), Anthony Ingraffea (CEE), and Natalie Mahowald (EAS)

Funding: \$74,204

Duration: 24 months

Sustainable Pest Management and Yield Increase Strategies



The ever-increasing demand for food is encroaching on natural ecosystems. The best option for increasing food production is to maximize yields from existing farmland with innovative agricultural practices that are both environmentally sound and economically beneficial to growers. Potatoes are the most important income source for Andean farmers, but their production is threatened by enormous losses to the Guatemalan tuber moth (*Tecia solanivora*). Jennifer Thaler (ENT), Miguel Gómez (AEM), Georg Jander (BIOPL), and Katja Poveda

(ENT) aim to develop an environmentally and economically sustainable pest management strategy for smallholder Andean farmers, using local resources to make the target crop unattractive to tuber moths, provide an alternate trap crop to attract the moths, and harness natural plant responses to the pests to increase yield.

Investigators: Jennifer Thaler (ENT), Miguel Gómez (AEM), Georg Jander (BIOPL), and Katja Poveda (ENT)

Funding: \$102,377

Duration: 24 months

School Gardens for New York: Ecological Literacy, Diet, and Physical Activity



School gardens have the potential to advance science education, increase students' fruit and vegetable intake, fight childhood obesity, and build childrens' ecological and agricultural literacy and connection to the natural world—yet few large-scale studies have measured school gardens' success in promoting learning and health outcomes. An interdisciplinary team led by Nancy Wells (DEA), Brian Wansink (AEM), Jennifer Wilkins (NS), Marcia Eames-Sheavly (HORT), and Gretchen Ferenz Fox (CCE) will organize a workshop of experts and

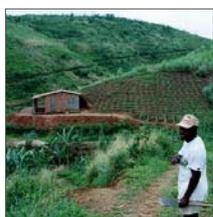
stakeholders to build a school garden network in New York State. The group will pilot test instruments and develop a school garden infrastructure—including web sites, data-collection interfaces, and training protocols—as steps toward a larger study of how school gardens may promote healthy, sustainable habits and knowledge among youth.

Investigators: Nancy Wells (DEA), Marcia Eames-Sheavly (HORT), Gretchen Ferenz Fox (CCE), Brian Wansink (AEM), and Jennifer Wilkins (NS)

Funding: \$50,518

Duration: 6 months

A New Framework for Evaluating Agrarian Development



Contemporary proposals to mitigate food and fuel insecurity often seem incompatible because they are based on different evaluations of agrarian development. Some frameworks focus on hunger, while others highlight poverty, land tenure security, social justice, or agricultural output. Led by Wendy Wolford (DSOC), Philip McMichael (DSOC), Ronald Herring (GOVT), Gregory Alexander (LAW), and David Kay (DSOC), this ambitious project will devise a common language for talking about rural development, combining qualitative

and quantitative information to create the Cornell Indicator of Agrarian Development. Crucial for state agencies, development organizations, social movements, and private investors, the tool will incorporate data from existing databases and new research to weigh central indicators of development, well-being, and environmental health in agrarian societies: sustainability, security, sustenance, and sovereignty.

Investigators: Wendy Wolford (DSOC), Gregory Alexander (LAW), Ronald Herring (GOVT), David Kay (DSOC), and Philip McMichael (DSOC)

Funding: \$107,507

Duration: 24 months