



Smithsonian

# 100 years of science in Panama



Smithsonian Tropical Research Institute, Panamá

STRI news

[www.stri.si.edu](http://www.stri.si.edu)

March 25, 2011

## Gamboa seminar

Monday, March 28, 12 noon,  
seminar speaker will be Teague  
O'Mara, Arizona State  
University

**Social influences on the  
development of ring-tailed  
lemur feeding**

## CTFS-SIGEO talk

Tuesday, March 29 at 10:30am,  
CTFS-SIGEO talk speaker will  
be Chen Lei, at the Large  
Meeting Room, Tupper

**Phylogenetic diversity and  
the species composition of  
tree communities**

## Tupper seminar

Tuesday, March 29, 4pm  
seminar speaker will be

William T. Wcislo, STRI  
**Niche construction by  
nocturnal bees in relation to  
sensory ecology and  
sociality**

## Bambi seminar

Please check your e-mails and  
STRI's web page at  
[www.stri.si.edu](http://www.stri.si.edu), for  
information on the next Bambi  
seminar on BCI.

## Is blood thicker than water?

In 1964 biologist William Hamilton introduced Inclusive Fitness Theory, which predicts and explains phenomena ranging from animal behavior to patterns of gene expression. With its many successes, the theory has become a cornerstone for modern biology. Recently a group of Harvard researchers challenged this theory in the prestigious journal, *Nature*. Now *Nature* has published sharp rebuttals from scores of scientists, including Edward Allen Herre and William Wcislo, staff scientists at STRI.

“Bees are probably the most useful group for studying why eusocial organisms have workers that do not reproduce, but the authors got a lot of their basic facts about bees wrong. For example, the authors argue that having defensible nests is the most important consideration for eusociality, but they ignore the fact that there are thousands of nest-making animals that are not eusocial,” said Wcislo, a specialist in the biology of bees. “What really caught my attention was that they completely misrepresented results of one of my own studies. This is just very poor scholarship that does not support their case at all.”



Herre



Wcislo

Says co-author, Allen Herre, “Challenging existing paradigms is an essential part of a healthy scientific process. However, the burden is on the challengers to present a better alternative, particularly when a paradigm has been as successful as Inclusive Fitness has been. Both the factual and theoretical basis of the case for their proposed alternatives falls apart with even mild scrutiny. They simply do not make their case. But their challenge is still useful because crucial parts of the theory come out stronger for having been tested, and researchers can better see where more studies are needed.”. *(Information provided by Allen Herre. Articles were distributed by Neal Smith. You may obtain them from [calderom@si.edu](mailto:calderom@si.edu))*

En 1964, el biólogo William Hamilton introdujo la Teoría Inclusiva de Aptitud Física, que predice y explica los fenómenos que van, desde el comportamiento animal hasta los patrones de expresión genética. Con sus muchos éxitos, la teoría se ha convertido en una piedra angular en la biología moderna. Recientemente, un grupo de investigadores de Harvard puso en duda la teoría en la prestigiosa revista *Nature*. Ahora *Nature* ha publicado una serie de respuestas tajantes de parte de un grupo de científicos que incluyen a Edward Allen Herre y William Wcislo, de STRI.

“Las abejas son probablemente el grupo más útil para estudiar por qué organismos eusociales

## Colón monthly talk

Thursday, March 31, Galeta invites you to the Smithsonian Talk of the Month at the Battery Morgan, Fort DeLesseps, Colón, at 7pm. Stanley Heckadon-Moreno will present

**One hundred years of history of our institution: 1910-2010 “Un siglo del Instituto Smithsonian en Panamá: 1910-2010.”**

## Arrivals

Nicole Michel, Tulane University, to study if mesoherbivores drive rainforest understory bird declines by limiting availability of preferred foraging microhabitat, on BCI and Gamboa.

Lauren Mills, Massey University, New Zealand, to study the impact of seasonal variation in food resources and ranging patterns on the reproductive physiology and behavior of female spider monkeys (*Ateles geoffroyi*): a test of the ecological energetic hypothesis, on BCI.

Matthias Sprenger, Universitat Koblenz-Landau, to study calcium cycling in the soil-fig-bat compartment of a Neotropical rain forest on spatially heterogeneous substrate, at Tupper.

Caleb McMahan, Louisiana State University, to work on reconstructing Heroini (Teleostei: Cichlidae) of heroes, convicts, angels and red devils.

tienen obreras que no se reproducen, pero los autores presentan bastantes datos básicos sobre abejas que son errados. Por ejemplo, argumentan que tener nidos defendibles es la consideración más importante para la eusocialidad, pero ignoran el hecho de que hay miles de animales que hacen nido y que no son eusociales,” dice Wcislo, un especialista en la biología de abejas. “Lo que realmente

captó mi atención fue que ellos interpretaron mal los resultados de mis estudios. Esto es simplemente una ciencia pobre que no apoya su caso en nada.”

Agrega el coautor Allen Herre: “Dudar de los paradigmas existentes es una parte esencial del proceso científico saludable. Sin embargo, el peso de presentar una alternativa mejor recae sobre los que la ponen a prueba, en particular cuando un

paradigma ha tenido tanto éxito como la Teoría de Aptitud Física. Tanto la base factual como la teórica de las alternativas que proponen se desmoronan aún con el más mínimo escrutinio. Simplemente no convencen. Pero la duda fue útil, ya que partes cruciales de la teoría se refuerzan al haber sido cuestionadas, y los investigadores pueden darse cuenta de qué otros estudios se necesitan.”

## Genes, wasps and witches

*Reflections on science and human progress*



**M**ary Jane West-Eberhard gave an informal public talk at the Tupper Center on Wednesday, March 23, as part of our Centennial Lecture Series. She entertained her audience brilliantly with examples from her work and that of her colleagues, illustrating why basic science is important and how it can unexpectedly have useful applications.

Nicknamed by one of her relatives as “Cousin Buggy,” she described herself during childhood as an insect collector surrounded by a large family, some of whom questioned her passion for science. She married an entomologist who “understood her”, and (lucky

for us) she turned into the scientist she is today... “In the 14th century, I would have probably been burned as a witch for working in a cemetery observing wasp nests...”

According to West-Eberhard, science is international, and one of the great advantages of being a scientist is the ability to question authority... with facts. “In the end, when emergencies arise, they come looking for the experts, but experts cannot be created overnight... everything must be connected and stored somewhere for when society needs it.”

Her book *Developmental plasticity and evolution* is the result of collaborative work with specialists, primarily her colleagues at STRI, and took her some ten years to complete. She expressed her thanks to STRI for giving her the unique opportunity to write it and to spend her career doing what she found most interesting.

Mary Jane West-Eberhard ofreció una charla informal para el público en el Auditorio del Centro Tupper, el miércoles, 23 de marzo, como parte de la Serie de Conferencias del Centenario de STRI. De manera brillante, amenizó al público con ejemplos de su trabajo y el de sus colegas, ilustrando por qué la ciencia básica es importante y cómo puede resultar útil

inesperadamente.

“Cousin Buggy” [La prima bichos], sobrenombre que recibió de un pariente, describió su niñez como una coleccionista de insectos intelectual rodeada de una familia numerosa que cuestionó su pasión por la ciencia. Se casó con un entomólogo que “la comprendió” y (para nuestra suerte) se convirtió en la científica que es hoy día... “En el siglo XIV, me hubieran quemado por bruja... por meterme en un cementerio para observar avispas...”

De acuerdo a West-Eberhard, la ciencia es internacional y una de las grandes ventajas de ser científica, es poder cuestionar a la autoridad... con hechos. “Al final, cuando las urgencias se presentan, vienen buscando a los expertos, pero los expertos no se hacen de un día para otro... todo tiene que conectarse y guardarse en algún lugar, para cuando la sociedad lo necesite.”

Su libro, *Developmental plasticity and evolution* [Plasticidad en el desarrollo y la evolución] es el resultado de un trabajo en conjunto con especialistas —principalmente con sus colegas en STRI— que le tomó cerca de diez años. Agradeció a STRI por darle la oportunidad única de escribirlo y por poder dedicarse durante toda su carrera a hacer lo que más le interesaba

## Arrivals

Justin McAlister, Clemson University, to study the evolution of life histories in geminate echinoderms: A comparative approach to unscrambling the relationships among environment, egg size, and the energetics of development, at Naos and Galeta.

Lucas Cernusak, Australian National University, to study the sun/shade acclimation of tropical tree seedlings, at Tupper.

## Departures

Fernando Santos-Granero to Lima, Peru, to do research on Yanasha migrants to the city of Lima and the Amazon tribe's migration to urban centers in general.

## New publications

Almanza, Alejandro, Coronado, Lorena, Tayler, Nicole, Herrera, Liuris, and Spadafora, Carmenza. 2011. "Automated synchronization of *P. falciparum* using a temperature cycling incubator." *Current Trends in Biotechnology and Pharmacy* 5(2): 1130-1133.

Berry, Richard P., Wcislo, William T., and Warrant, Eric J. 2011. "Ocellar adaptations for dim light vision in a nocturnal bee." *Journal of Experimental Biology* 214(8): 1283-1293.

Blackwell, Meredith. 2011. "The Fungi: 1, 2, 3 ... 5.1 million species?" *American Journal of Botany* 98(3): 426-438.

**Safety number:  
212-8211**

## Narinder Singh joins STRI as Chief of Maintenance

Narinder Singh K., manager of Grupo Haus Coronado Mall, was selected to fill the position of STRI's chief of Maintenance, effective March 14. He holds an engineering technician degree from the University of Panama, completed four years in Computer Science and Statistics at Universidad Santa María La Antigua in Panama City, and graduated with honors in Professional Management from Nova University.

Before coming to STRI, Singh accumulated 30 years of combined experience in customer service, maintenance repair, administration and management, budgeting, design and construction, inspection and physical facilities security. He has worked at Grupo Haus, Multiplaza Pacific Mall, Panama Ports Company, the

## Course on fungi, lichens and bryophytes

Eight specialists, including STRI's Noris Salazar, contributed in teaching a Workshop on Fungi, Lichens and Bryophytes from March 14-18, at the University of Panama. Other instructors included Robert Lücking, Thorsten Lumbsch, Sabine Huhndorf and Matt Nelsen, of the Chicago Field Museum of Natural History, and Julieta Carranza and Gregorio Dauphin, of Costa Rica.

The Workshop included conferences, talks based on graduate papers, the application of multiple methods, and the use of the internet resources for research and dissemination. A field trip to Campana National Park (photo above) was included in the Workshop.

Directorate of Engineering and Housing of the Southern Command, and other agencies.

We welcome Narinder, and wish him the best in this new position.

Narinder Singh K., gerente de Coronado Mall del Grupo Haus, fue seleccionado para la posición de Jefe de Mantenimiento en STRI, a partir del 14 de marzo. Se graduó como técnico en ingeniería de la Universidad de Panamá, completó cuatro años en ciencias de Computación y Estadística en la Universidad Santa María La Antigua de Panamá, y más adelante se graduó con honores en Administración Profesional en Nova University.

Antes de unirse a STRI, Singh acumuló 30 años en experiencia en servicios al cliente,



mantenimiento y reparación, administración y gerencia, presupuesto, diseño y construcción, inspección y seguridad física de instalaciones.

Trabajó en Grupo Haus, Mall Multiplaza Pacific, Panama Ports Company, la Dirección de Ingeniería y Construcción del Comando Sur en Panamá y otras agencias. Le damos la bienvenida y le deseamos lo mejor en esta posición.



Ocho especialistas, incluyendo a Noris Salazar, de STRI, contribuyeron para dictar un curso sobre Hongos, Líquenes y Briofitas en la Universidad de Panamá, del 14 al 18 de marzo. Otros botánicos incluyeron a Robert Lücking, Thorsten Lumbsch, Sabine Huhndorf y Matt Nelsen, del Field Museum of Natural History de Chicago, y Julieta Carranza y Gregorio Dauphin, de Costa Rica.

El seminario taller incluyó conferencias y charlas sobre trabajos de graduación, la aplicación de métodos multivariados, y el uso de los recursos de internet para investigación y disseminación. El Seminario también incluyó una gira al Parque Nacional Altos de Campana, como parte del Taller (foto de arriba).

## New publications

Bonachea, Luis A., and Ryan, Michael J. 2011. "Simulated predation risk influences female choice in Túngara frogs, *Physalaemus pustulosus*." *Ethology* doi:10.1111/j.1439-0310.2011.01889.x

Fincke, Ola M. 2011. "Excess offspring as a maternal strategy: Constraints in the shared nursery of a giant damselfly." *Behavioral Ecology* doi:10.1093/beheco/arr015

Goldsmith, Gregory R., Comita, Liza S., and Chua, Siew Chin. 2011. "Evidence for arrested succession within a tropical forest fragment in Singapore." *Journal of Tropical Ecology* 27(03): 323-326.

Gomes, Ana C. S., and Luizao, Flavio J. 2011. "Leaf and soil nutrients in a chronosequence of second-growth forest in Central Amazonia: Implications for restoration of abandoned lands." *Restoration Ecology* doi:10.1111/j.1526-100X.2011.00773.x

Rüger, Nadja, Huth, Andreas, Hubbell, Stephen P., and Condit, Richard. 2011. "Determinants of mortality across a tropical lowland rainforest community." *Oikos* doi:10.1111/j.1600-0706.2010.19021.x

Visser, Marco D., Jongejans, Eelke, van Breugel, Michiel, Zuidema, Pieter A., Chen, Yu-Yun, Rahman Kassim, Abdul, and de Kroon, Hans. 2011. "Strict mast fruiting for a tropical dipterocarp tree: a demographic cost-benefit analysis of delayed reproduction and seed predation." *Journal of Ecology* doi:10.1111/j.1365-2745.2011.01825.x



## STRI and ASU agreement renders impressive results

An agreement signed by the Smithsonian and Arizona State University about a year and a half ago, has produced impressive results for STRI. The agreement provides seed money for projects that qualifies for external funding, promotes inter-institutional collaboration, and creates novel opportunities in higher education.

Thanks to the agreement, 17 ASU faculty traveled to Panama, four STRI scientists visited ASU, and three of them—Sunshine Van Bael, Bill Weislo and Owen McMillan—are now adjuncts professors at ASU, and five new research proposals were submitted. Nine ASU students also traveled to STRI to join three Panamanian students for a course in Tropical Ecology.

Two projects are currently funded by the initiative: a study on the banks of the Panama Canal to assess the ecosystem services provided to Panama and global commerce, and a study of the origins of sociality based on tropical insects.

ASU received funds from the Virginia Ullman Foundation that will be used to bring interns to STRI, where our

scientists will serve as their mentors. This month, a workshop on critical thinking and biodiversity was offered to students and faculty of the University of Panama at the Tupper Auditorium and at the University, and we plan to continue using novel formulas to change teaching from a passive to hands-on encounter, where students actually do something and learn something cool as they experience the frustrations and excitement of discovery.

Un convenio firmado hace año y medio por el Smithsonian y Arizona State University, ha logrado resultados impresionantes para STRI. El convenio ofrece capital semilla para proyectos que puedan acogerse al financiamiento externo; promueve la colaboración inter-institucional y crea oportunidades novedosas de educación superior.

En el marco del convenio, 17 profesores de ASU viajaron a Panamá, cuatro científicos de STRI visitaron a ASU y tres de ellos, Sunshine Van Bael, Bill Weislo y Owen McMillan, son ahora profesores adjuntos en ASU, y se han logrado cinco nuevas propuestas de investigación. También viajaron

a STRI nueve estudiantes de ASU para unirse a tres panameños en un curso de Ecología Tropical.

Actualmente se financian dos proyectos en Panamá, un estudio sobre las laderas del Canal de Panamá: un estudio para medir su valor en servicios proporcionados a Panamá y al comercio global por los ecosistemas, y otro para conocer los orígenes del comportamiento social, con base en insectos tropicales.

ASU recibió fondos de Virginia Ullman Foundation que serán utilizados para traer pasantes a STRI donde nuestros científicos servirán como supervisores. Este mes se llevó a cabo un taller sobre pensamiento crítico y biodiversidad para estudiantes y profesores de la Universidad de Panamá en el auditorio Tupper y en la Universidad, y se planea seguir usando fórmulas novedosas para que la enseñanza de la ciencia deje de ser pasiva, convirtiéndose en un encuentro experimental, donde los estudiantes realmente hacen algo y aprenden algo genial, pasando por las frustraciones y la emoción del descubrimiento.

# CO<sub>2</sub> SYMPOSIUM

## Public Lectures

Thursday, March 31

Earl S. Tupper Research and Conference Center,  
Auditorium

8:30	<b>Welcome</b> <i>Eldredge Bermingham, STRI director</i>
8:35 - 9:00	<b>Introduction – scaling up from a promiscuous enzyme to biodomes</b> <i>Klaus Winter (STRI)</i>
9:00 - 10:00	<b>The Illinois soybean FACE experiment</b> <i>Andrew Leakey (University of Illinois)</i>
10:00 - 10:15	<b>Coffee Break</b>
10:15 - 11:15	<b>Temperate tree FACE studies</b> <i>Richard Norby (Oak Ridge National Laboratory)</i>
11:15 - 12:15	<b>Chances and challenges in forest scale CO<sub>2</sub> enrichment</b> <i>Christian Körner (University of Basel)</i>
12:15 - 13:15	<b>Lunch</b>
13:15 - 14:00	<b>Carbon balance and long-term elevated atmospheric CO<sub>2</sub> in a Florida scrub oak forest</b> <i>Bert Drake (SERC)</i>
14:00 - 14:45	<b>The Australian savanna FACE experiment</b> <i>Joseph Holtum (James Cook University)</i>
14:45 - 15:00	<b>Coffee Break</b>
15:00 - 15:45	<b>Growth and water-use efficiency of leguminous tree seedlings in elevated CO<sub>2</sub> and infertile soil</b> <i>Lucas Cernusak (Australian National University)</i>
15:45 - 16:30	<b>High CO<sub>2</sub> and high temperature vegetation of the past</b> <i>Carlos Jaramillo (STRI)</i>
16:30 - 17:15	<b>Limitations of tropical forest productivity by water, nutrients and CO<sub>2</sub></b> <i>Joseph Wright (STRI)</i>