



## Events Calendar

Hang it up as a reminder to attend our great upcoming programs!

## Grasshoppers Page 3

Some are small, some large, but all of them are important.

## Snakes Page 4

Snakes are way more than just movie villains!

## iShare Page 5

The story of a very successful collaboration.

## The Sweeter Side of Bees Page 6

Virginia Scott takes us inside the world of bees (do not worry, you won't get stung).



## Fossil Footprints on the Move

*Karen Chin, Curator of Paleontology*

Walking in the footsteps of giants; that is what Professor Martin Lockley has done for over 25 years, studying the fossil footprints of dinosaurs and many other animals. Lockley spent his career at the University of Colorado Denver amassing one of the world's most diverse and extensive collections of fossil tracks at the University of Colorado Dinosaur Tracks Museum in Denver. Now this extensively studied collection is coming to the University of Colorado Museum of Natural History in Boulder, and UCM curator Karen Chin and Lockley have been funded by the National Society Foundation to facilitate this move and make curatorial improvements to the collection.

The transfer of the collection is about 50% complete, and has been no easy task. The collection is comprised of over 2,700 original or replica specimens of fossil footprints and trackways (multiple footprints in a series) plus around 1,500 full size acetate track and trackway tracings. These specimens include tracks from non-avian dinosaurs (~47%), crocodylians and their kin (~14%), birds (~11%), pterosaurs (~7%)--as well as tracks made by turtles, rodents, arthropods, and even our hominin ancestors! Work on this project has involved photographing specimens, updating auxiliary data, customizing a database, and the physical transfer and re-housing of the specimens at UCM. The hardworking and indispensable "Track Team" working on this project includes geologist and track researcher Karen Houck (CU Denver), UCM collection manager Toni Culver, MF&S graduate student Tara Lepore, and numerous undergraduate students and volunteers. Culver has managed to do the equivalent of pulling a rabbit out of a hat in finding space for the collection in the already cramped fossil collection. The second half of the collection will be transferred to Boulder this summer.

Colorado boasts a number of important fossil track sites, ranging from the nearby Dinosaur Ridge and Triceratops Trail sites near Golden, to the Purgatoire River track site in southeastern Colorado. The Museum is fortunate indeed to acquire this world class collection, and we aim to maintain the educational outreach partnership that Lockley established at the well-visited Dinosaur Ridge site. Although the collection will soon be in Boulder, Martin Lockley and Karen Houck will continue to provide expertise on this collection as Curator Adjoints with the Museum. And Lockley will carry on his research on fossil tracks around the world.



Well, in the middle of this Spring semester it will be three full years since my arrival at the University of Colorado, at the helm of the Museum of Natural History. These years have seen the labors of many museum staff yield many wonderful fruits. The beneficiaries of this exciting work have been the citizens of Colorado, students, and many others at CU and along the Front Range, and the faculty and staff of the Museum as well.

The curators of the museum have attracted nearly four times the amount of hard-to-get grant dollars than they did only three years ago. And in this time frame they have published award-winning books, important scientific contributions across a spectrum of topics, and they have demonstrated their commitment to education, formal and informal, through the mentoring of excellent students, teaching classes and participating in Museum programs during the

days, weekends and evenings. Our collections have grown in important ways, with many new collections of fossils, cultural artifacts and botanical, zoological and phycological specimens having been added to CU's unprecedented holdings.

Our programs have flourished, and we are attracting many visitors to the Henderson building, including a 6-fold increase (from 2,000 to over 12,000) in the number of CU students who visit the museum annually. Great exhibitions on the Joe Ben Wheat textile collection, a potpourri of topics in Modern Life, and important new approaches such as those seen in the BioLounge have helped to attract unprecedented numbers to Henderson. We also have had exhibitions in other buildings on campus, and will see in the future collaborations with not only our cognate departments, but with departments from English to Engineering.

In addition to exhibitions, innovative programming at the Museum has included GAMES (Girls At the Museum Experiencing Science), Family Days (going from once a month to every Saturday during the semester) and lectures on topics from the natural history of beer, to collaborations with National Geographic, the American Institute for Archaeology, Department of Ecology and Evolutionary Biology and others have made for wide spectrum of topics and speakers. Museum resources are finding their way into classrooms in the Boulder Valley School District and in districts across the state of Colorado—from Fort Morgan to Montrose.

All of this momentum has happened in spite of large-scale renovations to the Henderson Building. The dedicated faculty, staff and students at the Museum, and across CU's campus, as well as our Advisory Board and other volunteers, have brought great ideas, entrepreneurial spirit and dedication to achieve the many successes I have listed here, and others too numerous to mention. We have benefited from wonderful support from the offices of the Dean of the Graduate School and Office of the Vice Chancellor of Research. And while the next three years at the Museum will certainly be as, or more, exciting as we contemplate ways to further our mission, I have a deep sense of satisfaction of a job well done. Thank you for your help and support along the way.

Sincerely,  
Patrick Kociolek



## Grasshoppers

by Cesar Nufio, Researcher affiliated, Entomology Section of the CU Museum of Natural History and the Department of Ecology and Evolutionary Biology.

Grasshoppers are considered the dominant herbivores of grassland ecosystems in terms of their overall biomass and the amount of vegetation that they consume. In Byer's 2003 book, "Built for Speed: A Year in the Life of Pronghorn," for example, the author estimates that the tonnage of grasshoppers is about 120% that of all the big herbivorous mammals (bison, elk, deer, pronghorn etc.) combined at the National Bison Range in Montana. And yes, although we tend to highlight the giraffes and herds of antelope and zebra roaming in the African savanna, the amount of grassland vegetation consumed in the savanna by grasshoppers can be comparable to, or may even exceed, that of all of these big mammals together. Grasshoppers are also quite diverse, with nearly 13,000 species being estimated to exist worldwide.

Grasshoppers are not all the same. There are tall grass specialists, short grass specialists, herbaceous plant specialists and those that feed on a mix of vegetation types. There are small and large grasshoppers, grasshoppers with and without wings as adults, rare and abundant species and those that are most common during the early, middle or late parts of the spring and summer. In Colorado, there are 132 documented species of grasshoppers. And if you look closely while walking the trails within Boulder County, you may encounter 54 of these species.

Part of my research program involves using, collecting, and surveying grasshoppers to understand the effects of climate change and urban fragmentation on insects along the Front Range. Regarding climate change, we are conducting a multi-year resurvey of various grasshopper communities along an elevational gradient that runs from the foothills of Boulder to the subalpine habitats near the CU Mountain Research Station. Our current study uses a similar survey study conducted 50 years ago to determine how measured changes in climate are impacting species. For example, at mid-elevations where temperatures have increased the most, we are finding that grasshoppers can become adults almost a month earlier than they did 50 years ago.

The "Modern Life Exhibit" at the CU Museum introduces visitors to the biology of grasshoppers and highlights how they are different than katydids and crickets and how they sing. This grasshopper portion of the exhibit also highlights some species that you may see during your walks at Chautauqua Mesa. Come visit the "Modern Life" exhibit and become introduced to your dominant grassland neighbors.



**A MUSEUM MEMBERSHIP IS A WONDERFUL GIFT** Call 303-492-3396 for more information.





## Snakes

Robert C. Jadin – Department of Ecology and Evolutionary Biology



Black-headed Calico Snake (*Oxyrhopus melanogenys*)



Amazon False Fer-de-lance (*Xenodon severus*)



Timber Rattlesnake (*Crotalus horridus*)

The mere notion of “snakes” can conjure up fear for some and awe for others. But like them or not these limbless reptiles are an important part of our environment and society. The vast diversity of snakes may be surprising to some who are not aware of just how diverse this group of organisms is but their importance in our environment should be known to all. Although many snakes are venomous and can pose a threat to humans they are very useful in that they are prey for many other organisms, like birds, and eat numerous rodents. One example is India where it is often illegal to kill snakes. These laws exist because mice and other rodents often decimate crops throughout much of the country which the economy and an overpopulated society depend on. Populations of snakes greatly reduce the number of rodents and thereby reducing the amount of devastating crop loss due to the rodents. Equally as exiting and interesting as snakes are other animals with similar exhibits in the Changing Gallery such as bees and grasshoppers.

The University of Colorado Museum of Natural History has an excellent exhibit about snakes in the Changing Gallery in the “Modern Life” exhibit, where you can learn about scientific information on snakes. At the center of this exhibition are some fun snake facts, such as there being 2,900 different species of snakes which vary in sizes, from tiny fossorial blind snakes with maximum sizes of 10 centimeters long to large pythons and anacondas that can reach 10 meters in length. This exhibition displays actual photographs, preserved specimens, and even skeletons to provide a realistic look at what snakes are really like.

Additionally, this exhibition shows how snakes are portrayed in different realms of society. For example, this exhibition includes illustrations and discussions on how snakes played important roles in Greek and Roman mythology, spanning from fearsome creatures of terror, like the snakes on the head of Medusa, to the Caduceus and Rod of Asclepius, for which snakes have been portrayed for centuries as medical symbols. Even modern religions, such as Hinduism and Buddhism, which view the snake as a symbol of fertility and protection and not necessarily something to be feared, and Christianity which often perceives the snake in Genesis as a crafty and deceitful creature. In our modern society, movies have also portrayed snakes in various ways from classics like the “Jungle Book” to more recent movies like “Snakes on a Plane.” This exhibition discusses these things and more, so come visit and learn more about these fascinating and vital organisms. This is an exhibition that you do not want to miss!

**GIFT STORE** Members always receive a 10% discount!



## iShare: A Grand Success

In November, the University of Colorado Museum of Natural History was honored to host the celebration of the iShare collaboration that involved much work and many hands from across the world. The efforts resulted in an incredible interactive website, which now allows the Taiwanese, Navajo Nation, and Paiwanese communities to both privately and publically share their cultures with each other as well as the greater public.

The iShare is a perfect example of four very different cultural communities coming together to share their stories with one another as well as the rest of the world. The National Taiwan Museum, The Navajo Nation Museum, The Laiyi Indigenous Museum, and the University of Colorado Museum of Natural History are the participating museums that have brought together the Taiwan, Navajo, and Paiwan communities. By utilizing the power of technology, "iShare: Connecting Museums and Communities East and West" is a way to build partnerships that will help museums serve and represent the communities whose objects they house. A website has been created that allows the communities to share indigenous cultural collections both publically and privately. Visitors to the interactive website can read stories, listen to oral histories, and gain a more rounded understanding of indigeneity as experienced by both the East and the West.

In order to celebrate the launch of the iShare website, the University of Colorado Museum of Natural History hosted representatives from Taiwan, Paiwan, and the Navajo Nation in a full day event last November. The event started with an IT presentation on the development and background work involved in creating the website. It was then followed by cultural presentations from the representatives and a live performance from the Seven Falls Indian Dancers! With delicious food, delightful music, and a new way to understand the cultures behind many of our favorite museum pieces, the iShare event was an experience to never be forgotten. If you are interested in learning more, please visit the iShare website: <http://en.projectishare.com/about>



From left to right: Gaku Ibutoe (Paiwan), Chen-Yu Wei (NTM), Ms. Chen-Yu Wei, Head of Education and Exhibition Department at National Taiwan Museum, Clarendo Begay (Navajo), Curator at the Navajo Nation Museum, Michelle Henry (Navajo), Ms. Michelle Henry from the Navajo Nation, Jen Shannon, Curator and Assistant Professor of Cultural Anthropology at CU Museum of Natural History, Zhi-Qiang Liao (Paiwan), Mayor of Laiyi Village.



Village of Sandimen. iShare partners dancing with host and Miss Sandimen, June 2011.



Navajo liasons: Rena Martin and Clarendo Begay talking with Paiwan chieftain Selep Curimudjuq.

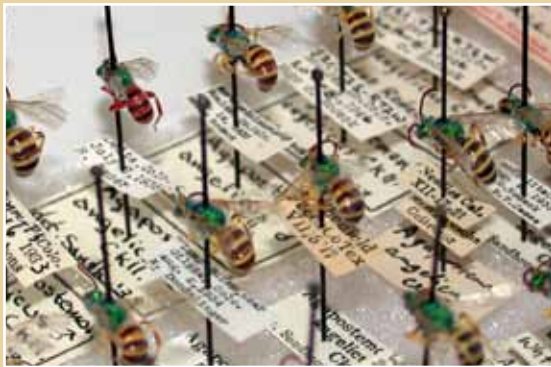
**DO YOU WANT TO BE A VOLUNTEER EDUCATOR?** Contact the Education Coordinator at 303-492-4843.





## The Sweeter Side of Bees

by Virginia L. Scott, Collection Manager, Entomology



*Agapostemon angelicus* © Virginia Scott



*Agapostemon coloradinus* © Virginia Scott



*Andrena erythrogaster* © Virginia Scott



*Bombus huntii* © Virginia Scott

Bees. To some, the word brings to mind thoughts of delicious honey buns or fruits dripping with juice. To others, it means the sting that comes with a misplaced foot. To a lucky few, it conjures up the myriad of forms and life histories that encompass the diversity of these fascinating insects – the bees.

“Modern Life: Exploration, Innovation, Pollination,” an exhibit currently on display at the University of Colorado Museum of Natural History, includes a section on bees. It was developed with assistance from the Museum’s Entomology Collection, which houses over 100,000 bee specimens, all neatly prepared and labeled with data telling where and when each specimen was caught. Approximately 70,000 of these bees were collected in Colorado over the past century. These document both a vast richness of bee species and a wealth of bee research. The data from these specimens was the basis of a new publication on the “Bees of Colorado” (Natural History Inventory of Colorado, number 23) that I wrote in collaboration with John Ascher (American Museum of Natural History), Terry Griswold (Bee Biology and Systematics Lab), and Cesar Nufio (University of Colorado). This publication is the first statewide synthesis on Colorado’s bee fauna. It contains a list of the 936 bee species that call Colorado home, a synopsis of bee research in Colorado, and the life history traits of Colorado bees.

In many ways, “Bees of Colorado” was conceived in Upper Michigan in June 1983, when I, an eager, yet naive undergrad, was introduced to R-2. R-2 was a blue (yes, some bees are blue) orchard mason bee, *Osmia lignaria*. She had already established her solitary nest (most bees do not live in hives) and was provisioning a reproductive cell with pollen and nectar (no honey for this species) that would serve as food for one of her fifteen offspring. I grabbed a clipboard, pulled up a chair, and began recording R-2’s every move: when she exited her nest, when she returned, and what she was carrying, be it pollen for provisions or mud for nest partitions. From sun up to sun down, R-2 and I were inseparable, until the afternoon of the tenth day, when R-2 failed to return home. Perhaps it was a crab spider or simply old age (some bees live only a few weeks as adults), but she had sparked an interest in me that turned into a life-long passion for bees. Fast forward to January 1994 when I migrated to Colorado, now armed with a degree in entomology, 11 years of bee field experience, fifteen years of museum collections experience, and my favorite net, to begin working as the Collections Manager of the Entomology Collection. Fortunately for me, the Entomology Collections at the University of Colorado of Natural History Museum were built primarily by curators whose taxonomic interests centered on bees.

Tiny (3mm) to large (26mm); fuzzy or bald; black, yellow, green, blue, or red; ground-nester, twig-nesters or usurpers of abandoned rodent burrows; solitary, social, communal, or parasitic; pollen specialists or pollen generalists; bees are diverse and fascinating. They pollinate the world around us, usually without notice. Look for a bee on a flower near you and discover the sweetness.

**MUSEUM TOURS** Contact the Education Coordinator at 303-492-4843 for information.

# Membership Application

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- Director's Circle \$1000

### Corporate Membership

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I would like to start receiving Museum Insights (biannual Newsletter) via e-mail.

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of Natural History

Enclosed is my check for \$ \_\_\_\_\_

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### Mail to:

University of Colorado Museum of Natural History  
218 UCB  
Boulder, CO 80309-0218

## Looking Forward!

As to be expected, the Museum is always brainstorming brilliant ideas for potential events and exhibitions to surprise, thrill, and educate the Boulder public; and this spring is no exception! Starting with the newest exhibit installation in the BioLounge, internationally and nationally recognized artist Kim Abeles has created a sixteen foot visual statement about the use of lichen as environmental indicators of pollutants. This incredibly profound video wall serves as a beautiful compliment to the exceptional "smog collector plates" dotting the adjacent BioLounge walls. Be sure to visit this exhibit and then make an appointment to get your smog checked!

Let us not forget about Family Days! Not only will Family Day events be changing themes every month, they will also be happening every Saturday! There are no more excuses to miss out on the crafts, hands-on activities, and learning experiences that come standard with the always free Family Days. In March come learn about "Food: It's Everywhere!" To take us into spring, April's theme will be "Beetlemania," and May will kick-off summer with "Liquid Water: Streams, Rivers and Lakes."



Alan Nelson guiding a Tree Walk



Learning about diatoms

**NOW YOU CAN DONATE ONLINE!** Go to the Museum website and click on "Get Involved."







MUSEUM OF  
NATURAL HISTORY  
UNIVERSITY OF COLORADO

218 UCB, Boulder, Colorado 80309-0218

On the Boulder Campus in the Henderson Building at 15th and Broadway. Visitor parking is available at Euclid and 18th at the AutoPark. An RTD bus stop is located at 14th and Broadway.

**Museum Hours:**

Monday-Friday 9:00 am-5:00 pm

Saturday 9:00 am-4:00 pm

Sunday 10:00 am-4:00 pm



University of Colorado  
Boulder

# MUSEUM INSIGHTS

COME SEE WHAT'S INSIDE

An extraordinary collection of fossil footprints is moving in!

