



# BIOINSPIRED!

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THE BIOMIMICRY INSTITUTE

## Ask Nature! (Bryony Schwan)

The Biomimicry Institute (TBI) is excited to announce that we will be launching the second beta version of the biomimicry design portal at the US Green Building Council's Greenbuild conference in Boston, November 19-21, 2008, thanks to major sponsorship from Autodesk. TBI founder and board president, Janine Benyus and the pre-eminent Harvard biologist Edward O. Wilson will be the closing keynote speakers with Archbishop Desmond Tutu as opening keynote speaker.

Autodesk, the California-based company and world leader in design innovation technology, has generously stepped forward as the founding corporate sponsor of the biomimicry design portal. Thanks to Autodesk's magnanimous support and the support of the Toledo and Max Simon Foundation's, TBI has been able to develop the next beta version of the portal called Ask Nature. In 2007, we partnered with the Natural Capital Institute and funded the open sourcing of their Wisser Earth software platform. Our software engineer, Tim Greiser, has since been customizing the platform and in July we teamed up with IDEO, the leading innovation and design company, to develop the user interface of the site. IDEO has also generously contributed a significant amount of pro-bono work to the project. Under the leadership of Valerie Casey, IDEO's design team is creating not only a beautiful and inspiring user interface but is transforming a complex site architecture into an easy-to-use user interface.

In addition to the new navigation and look and feel of the site, the Biomimicry Guild has donated a mountain of data to the site. Researchers at the Guild have been combing the world's biological literature for nature's great ideas that ought to be mimicked in preparation for Janine Benyus' upcoming new book "Nature's 100 Best." This data will be added to the current 1700 data sets already in the first version of site. We are also really excited to be collaborating with E.O Wilson's Encyclopedia of Life (EOL) portal, a project to document all species of life on Earth. EOL is "an ecosystem of websites that makes all key information about all life on Earth accessible to anyone, anywhere in the world" and our goal is to share data with the EOL site. Specifically, we hope to link to the natural history of specific organisms through their site and have biologists entering data on the EOL site identify the biomimetic strategies of their organisms using our functional taxonomy.

Of course, Ask Nature will not be completed by Greenbuild because the site is meant to be ever growing and adaptive, but we think everyone will be excited by the strides we have made on the project and we look forward to your feedback. Finally, I would like to thank and acknowledge the people and organizations that worked on and funded the first beta version of the project. A special thanks to John Abele and the Argosy Foundation for their initial funding and thanks to the Kendeda Fund and the Adam Lewis foundation for their major support of this project and all of TBI's other work. Thanks to Alexis Karolides and the team at Rocky Mountain Institute for their enormous contribution to establishing the project. Last but not least, thanks to Jeremy Faludi, Greg Junell and Vinay Gupta for their work on developing the original portal prototype.



[Bryony Schwan](#)

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**The BioInspired! Newsletter publishes material from a wide range of sources. The opinions expressed in articles are entirely those of the authors and do not necessarily represent the views of The Biomimicry Institute.**





## Biomimicry in K-12 Education (*Sam Stier*)

An Unfolding Story of Passion and Inspiration  
(Suitable For Young Audiences)

*Sam Stier is Director of K-12 and Non-formal Education at the Biomimicry Institute.*



The Missoula Coyote Choir

Biomimicry is beginning to make its way into K-12 education, thanks to the passion of a few truly admirable teachers. Because biomimicry is a new concept (newer even for K-12 educators than for design professionals who are more familiar with it) and because there is little “off-the-shelf” biomimicry

curricula at present, integrating biomimicry into K-12 education is necessarily a patient undertaking.

But, as you will read in the short articles below, the rootlets are setting down into the soil and sprouts are starting to emerge into the sunshine. To be a part of this beginning is an extremely exciting time. This Fall, the Institute will be releasing the Biomimicry Children’s Album, [Ask the Planet](#), along with curricula packets that support the CD. More terrific [K-12 biomimicry curricula](#) are being added to the Institute’s website every month, and collaborations with more educational partners are in development. If you are already teaching biomimicry in your classrooms, let us know! And if you want to try to include biomimicry in what you are doing, let us help you get started! The Institute is here to help this network grow.



Sam Stier

## Developing the Minds of Young Biomimetic Thinkers (*Torrey McMillan*)

*Torrey McMillan is the Chair of the Sustainability Studies Department at The White Mountain School, a small independent high school in northern New Hampshire. She teaches courses across the disciplines, all with a focus on sustainability.*

Biomimicry was a new semester-long upper-level elective at The White Mountain School this spring. I am not trained in biomimicry, although I have a background in ecology, natural resources and education. When I was asked to teach a new science elective, I settled on a course in biomimicry because it links so strongly to the principles and practices of sustainability, and because it is hopeful, solution-oriented, and just plain cool! Students hear enough about the challenges we need to solve in our world. They also need to learn about the hopeful solutions that people are developing. Biomimicry offers this. It worked! My students felt a buzz around this material. They came into class telling me that they had been talking about the reading on their own in the evening. They got interested in the structure of ecological systems and the importance of diversity (not just biological diversity). They started using words like resilience, redundancy, and complexity as they described the qualities of stable, healthy systems. They began to ask the question, “How does nature do this, and can we do it that way, too?”

Building on my own background, I chose to orient the course toward biomimetic systems. I broke the course into four units – shelters, business systems and practices, water purification, and agricultural systems.

In each unit we first explored conventional practices and design principles. Then we studied natural systems and designs that could inform our own thinking. For the unit on shelters, we had the architect who designed our science building come speak about the design process and building features, with a focus on how they related to biomimicry. The business systems unit looked at our current business models and practices, and then looked at how nature conducts business. The process was similar in each unit, each time culminating in a project that asked students to apply biomimetic thinking to their own project in that field: a house design for a specific location, the construction of a small-scale ECO Machine to purify water, a description of biomimetic business practices, and the design of a perennial forest garden for our campus.

Examples of assignments and student work from these units are posted in the **High School** section of the Biomimicry Institute’s [Curricula](#) page.



The ECO Machine

At the end of the term, students reflected on what they learned from the class. The lessons were diverse and important. Some of their thoughts about the most important things they



## Developing Young Biomimetic Thinkers (continued)

learned in the course are below. We can, indeed, be hopeful about the future if our future leaders think like this!

*Before I took this class I had no idea what sustainability was and didn't really care to. But after a few days in this class I was intrigued with the subject. And after a semester of learning about it and biomimicry I believe that I have learned a lot of valuable information that... goes above and beyond the classroom. I think that the ideas... will not only help me be knowledgeable in the new and emerging field of biomimicry but also change the way that I look at the world forever. If I can take the ideas of mimicking nature and use them in my life I feel as though I can make a change on myself and society. – Spencer Graham*



Students working on the ECO Machine

*We spend so much time trying to reinvent the wheel rather than using what is already created and fine-tuned for thousands and thousands of years... Learning to see through that natural systems lens may take a long time but it is something that I would like to work on. – Christina Blank*

*I loved it because everything we learned was something that could be changed or another way at looking at something that already existed. I think this whole concept is incredibly important mainly because it has really given me some hope that we may be able to change something. – Sam Allen*



[Torrey McMillan](#)

## Stepping Sideways: Teaching Biomimicry Through Poetry (George Ttoouli)

*George Ttoouli is Education Projects Coordinator for the [Poetry Society UK](#), which works globally to support poetry readers, writers and educators. He is also a freelance editor and writer, and an Honorary Teaching Fellow for the Warwick Writing Programme at the University of Warwick.*

I recently coordinated development of three [resource packs](#) on ecology and poetry for the [UK Poetry Society](#), including one titled [Biomimicry : Poetry](#). The project commissioned the services of Mario Petrucci, an experienced poet, ecologist and educator, to write a series of poems and lesson plans with accompanying teachers' notes.

There were several reasons for this project. Firstly, there is the Poetry Society, which promotes the study, use and enjoyment of poetry across the world. It has been around for nearly a hundred years, supporting writing groups, teachers, readers and writers of all levels and backgrounds. We saw this project as fitting in perfectly with the Society's aims of applying poetry in schools in relevant ways. Biomimicry is important to humanity's future, to how we, as a species, deal with dwindling food, water, oil and land resources.

And why can poetry not say something relevant about this? Poetry and science is an old topic of conversation. Since I started working on this project at the Society, I have been tripping over articles, essays, and activities, both active and archived, every which way I turn. Many of these operate on a conceptual or philosophical level, asking questions like, "Are

poets and scientists the same?" They investigate how each operates and engages with the world. The end result of these discussions is often to evaluate one as better than the other.

I wanted to sidestep this discussion and get straight down to something useful as well as applicable. I was lucky to find similar thinking in Mario, who jumped straight into the commission, blossoming poems and then developing lesson plans and support notes for teachers to really make use of this material in class. Biomimicry is a vast topic to think about, so the main aim was to go through the various case studies, finding the poetry in the science (taking what was there already) and 'lighting it up' for readers.

After watching a YouTube video of Janine Benyus talking about [twelve biomimicry case studies](#) at TED, I was taken by the idea of 'heat, beat and treat' compared with how nature 'adds information to matter'. This, to me, is a metaphor for how poetry works, in comparison to everyday language. Instead of hacking and chopping words together until they give the correct sense, poetry steps outside of the box and looks for original word combinations whose sum will be greater than its parts. As Samuel Taylor Coleridge put it, "the best words in the best places". I propose that is where poets and scientists are most suited to working together: where ideas for how to understand the world open up new possibilities and potential for how humans can live in the world.





## Stepping Sideways (continued)

That was one goal for our project. And then there are the practical reasons for doing something like this. Teachers do not have access to cutting edge science in the classroom. Often this science is not presented well enough to be accessible to them, or teachers do not have the time to engage with new knowledge in their fields because they are often so busy with administration (at least in the UK!). At secondary school (the upper school equivalent in the UK), education becomes focused on narrow disciplines, with little cross-over between subjects. We wanted to provide a resource that would allow science teachers to illustrate concepts differently to their students, and literature teachers to bring some new knowledge into their class rooms too. Biomimicry seems to rest on the nexus between many subjects and many ways of thinking. This kind of interdisciplinary collaboration is often the place where people become most creative.

That is what it boils down to: finding the time and space to be able to think ourselves out of the hole we have dug ourselves into; how to solve problems such as oil usage, wastage in manufacturing, soil nutrient depletion and pollutant use. Poetry is not the solution to these issues, but the answers may well lie in finding the right angles from which to look at the problems, which is the kind of tangential thinking that poetry can cultivate.



[George Ttoouli](#)

### each shell grows

first putting out  
its layer : molecular pro  
-tein as secretly arrayed as that

terracotta army but with  
hands linked among the ranks &  
mouths held wide with evolution to sky

of sea : care-full in-  
dentures inviting world to con-  
form teeth zig to zag at heels of another in-

coming hard-chalk  
army brought to attention on  
their shoulders & so shaping what world meets

though once they have  
wrought enough hard enough  
down on their heads buried selves beneath them-

selves in what world sifts  
in then their bloodless revolution  
shuts each mouth so world stops coming yet because

shell has made itself  
watched shore boils with shells  
& because shelled creature is both outward & in

-ward an unprotecting world comes to  
it makes shushing lullabies  
of it &

protects

© [Mario Petrucci](#) 2008

## Ripple Effects from a Biomimicry Talk (Hilary Staples)

*Hilary Staples is a high school Biology and Environment Science teacher at San Domenico School, California.*

At my school's Earth Day celebration this year I had one of those silver-lining moments. Our keynote speaker canceled at the last minute and I thought what now? But my fellow coordinators turned to me and said "please do a biomimicry talk." Fortunately I was prepared, because I have been giving talks to educators around the San Francisco Bay area at Green Your School Conferences and Environmental Education Resource Fairs.

My educator audiences were always interested and engaged, but nothing prepared me for the reaction of this audience of middle school and high school students. As soon as my talk and our opening ceremony was complete, I was ready to run

off to deal with the million other details of running a day-long event, but I was stopped in my tracks by one of our best students hopping from toe to toe with excitement. "How do I study THAT? I want to go to college for that - does Cal have a program? Stanford?" Then a hand on my shoulder, "you had them riveted!" exclaimed one middle school teacher with disbelief: "that never happens - especially when



**Students and teachers work together on a permaculture spiral in the school garden**



## Ripple Effects (*continued*)

someone talks for 40 minutes.” I could barely answer all the questions and respond to the comments, as I was trying to also get people to their next station on time. I continued to have students approaching to me all day and for the next week thanking me for the talk, AND wanting to know how they could find out more. If you are not someone who hangs around teenagers a lot, let me tell you, this is unusual behavior.



**Construction of a student-designed labyrinth inspired by the natural form of an oak tree**

The success of a keynote on biomimicry was further cemented at lunch when I realized the greater affect of a solution-based opening to the day. I was eating with some of our guest speakers. As we compared our experiences doing a number of Earth Day-type celebrations that month, one speaker noted a distinct difference. She shared

that at one school the student asked her before she even began: “is this bad news? Because if it is, I can’t take anymore today” and then proceeded to walk out of her talk. She was speaking about plastics in the oceans; the news is not “good.”

We talked about how much everyone needed to hear about some of the innovations and ideas for change that were hopeful and inspiring. She said she could see the difference in the “take action” attitude in which our students were entering her session that day and the connections that some were making to biomimicry.

I should also share that I typically include biomimicry in my classroom activities as well. My sophomore Biology students brainstorm some biomimetic appreciations when they are completing their taxonomy presentations. And my seniors in Environmental Science work on designing a Green City using local organisms for inspiration. On my course evaluations many students choose to comment on the biomimicry assignments as being one of their favorites. However, I had never hit such a wide audience before, and it felt great.



[Hilary Staples](#)

## In Lak' ech' a Lak' (*Cindy Gilbert*)

*Cindy Gilbert is Director of University Education at The Biomimicry Institute.*

In July, Denise DeLuca (TBI Outreach Director) and I faced the incredible opportunity and challenge of imparting the concepts and tools of biomimicry to a group of eager Mexican professionals during a nine-day workshop arranged and offered through the Department of Architecture at the Universidad Iberoamericana (UIA), Mexico City. Not willing to give up the chance to meet this challenge or visit the stunning variety of ecosystems of the Veracruz region of Mexico, we grabbed our Spanish dictionaries, donned our white knee socks (as recommended by trusted local hosts to combat the mosquitoes and surely not to damage our fashion image!), and made our way to Mexico. Our journey began in Mexico City (a city of 20 million residents) with Denise’s key note lecture at UIA. This was also the culminating lecture of the UIA Diploma Course on Sustainable Design and Construction. The 33 workshop participants hailed from

several disciplines including sustainable business, management, marketing, architecture, industrial design, engineering, psychology, and environmental law. We also had three local biologists in tow for the duration of the workshop: Juan Rovalo, Delfin Montanana and Sonia Castro.

From Mexico City our journey followed the rhythm of the Bobos River as it meandered to the Gulf of Mexico through desert, volcano, alpine, rainforest, riparian, cave, and mangrove ecosystems. As the group neared the mouth of the river



**Planting the seeds of biomimicry at the fertile grounds of El Cuajilote archaeological site, a pre-Hispanic ceremonial ruin dating back to 600 A.D.**



## In Lak' ech' a Lak' (continued)

our connection to Nature and each other grew stronger. As more time passed we discovered that we were intricately interconnected despite our cultural, professional and geographical differences. We realized that each of us share the same intense desire to make regenerative change both for the environment and humanity whilst being productive and conscientious professionals in our distinct fields. Even more profound, we learned what Nature has always known and what the Mayans used not only as their greeting but as a way to live honorable and conscious lives, *In Lak' ech' a Lak'*, or as it translates to English *I am you and you are me*. Simply put, that we are united - all of Nature including humanity; everything we do to or for ourselves, we do to or for another.



**I am you, you are me and we are Nature. Students self-assemble to mimic the spiral form prevalent in Nature.**

By sharing the biomimicry tools with this thoughtful and insightful group and listening intently to their concerns, passions, questions and ideas, Denise and I became keenly aware of how our own knowledge and understanding of biomimicry teaching methodology and learning materials were deepening. We cannot thank enough our generous hosts, Carolyn Aguilar-Dubose (Coordinator of Undergraduate Architecture Program, UIA), Raul de

Villafranca (Architecture Faculty, UIA) and Jorge Kanahuati (Executive Director, Enlaces Ambientales), for their logistical, administrative, and recruiting prowess. Even more important is their unflagging dedication to expand and adapt their understanding of biomimicry methodology to better train the students and professionals that inhabit the fertile niche that will undoubtedly become the biomimicry hub for Latin America. What we do to deepen our understanding of biomimicry teaching methodology for others, such as the participants of the Mexico workshop, we do for the greater global biomimicry community, The Biomimicry Institute, and ourselves. *In Lak' ech' a Lak'*.

[Cindy Gilbert](#), M.Ed., M.S.  
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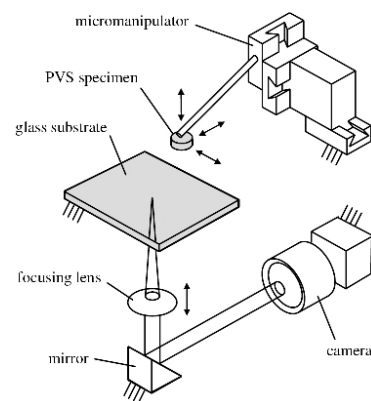


## What Beetles Can Teach Us About Adhesion (Michael Varenberg and Stanislav Gorb)

*Dr. Michael Varenberg and Dr. Stanislav Gorb are from the Evolutionary Biomaterials Group at the Max-Planck-Institute for Metals Research. Their interests include biological attachment, functional morphology and biomechanics, evolution of structure and functions, behavior of arthropods, and animal-plant interactions.*

Robust adhesion outside the laboratory faces many challenges, from uneven surfaces to dirt and other contaminants. These problems are even more severe in aquatic environments, where water can physically block adhesion while also weakening the chemical bonds of many adhesives. Considerable research has been carried out on underwater adhesion based on complex bio-inspired polymers. Analysis of adhesion in terrestrial organisms suggests "contact splitting" could lead to a self-cleaning, re-useable dry adhesive that works in wet conditions.

Insects, arachnids and some reptiles have the ability to stick to surfaces using either spatula-shaped or mushroom-shaped contact elements (setae). The former depend on active lateral loading and are most commonly associated with locomotion and other muscle-driven temporary attachment. Mushroom-shaped contact elements are passive, allowing long periods of adhesion without involving muscles.



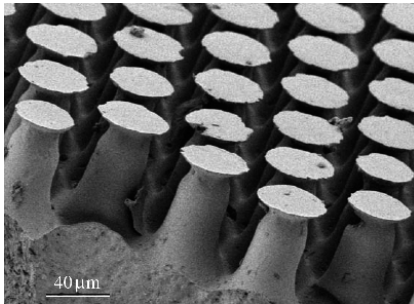
**Schematic of the experimental set-up(2)**





## 'What Beetles Can Teach Us (continued)

Based on an analysis of the tarsal hairs of leaf beetles (*Chrysomelidae*), a microstructured adhesive was made from polyvinylsiloxane (PVS) with 100  $\mu\text{m}$  long elastic microfibers terminating in 48  $\mu\text{m}$  mushroom-shaped contact surfaces. This adhesive was tested against hydrophilic and hydrophobic (silanized) flat glass substrates. The research setup allowed for detailed study under various compression, tension and shear forces.



**Mushroom-shaped microfibers forming contact surface of structured PVS specimens.<sup>(1)</sup>**

Adhesion comparisons between flat and structured PVS in air showed that the mushroom-shaped contact surface doubled the pull-off force. When flat PVS was tested under water, adhesion was reduced to 12% due to the effect of water on van der Waals forces. However, structured PVS showed 20 times greater adhesion in water, exceeding the adhesion of structured PVS in air and demonstrating that an adhesion mechanism other than van der Waals interaction was at work.

Detailed analysis let authors suggest that the mushroom-shaped contact surfaces may act as passive suction cups. During compression, the microfibers quickly make contact with the substrate due to the thin edges of the fiber 'plates', even if the surfaces are not perfectly parallel. Tension on the microfibers forms a void between the contact plate and the substrate, with the thin plate lip maintaining a seal that prevents surrounding air or fluid from entering the void. The microfibers are able to maintain adhesion under high compression as well as moderate shear forces, demonstrating robust and stable behavior under overload conditions<sup>(2)</sup>.

Laboratory research into this microstructured fibrillar adhesive has led to new insights about its biological prototypes. Earlier experiments that varied the surrounding atmosphere had abandoned suction as a primary source of adhesion in insects with mushroom-shaped setae. However, some insect setae appear to secrete fluids, which would maintain relatively constant suction until the pressure drops below the cavitation threshold. In addition, the mushroom-shaped geometry of the adhesive elements of some marine organisms suggests that shape may be as important as chemical bonding or van der Waals forces<sup>(1)</sup>.

Comparative studies between different species helped identify the key features underlying adhesion, allowing faster abstraction of those features which needed to be incorporated into the artificial adhesive. Collaboration was also critical to the success of this research, particularly with the company that developed the complex shapes of the microstructured laboratory prototype.

### References:

- (1) M. Varenberg, S. Gorb; A beetle-inspired solution for underwater adhesion; *Journal of the Royal Society interface*, 2007
- (2) M. Varenberg, S. Gorb; Close-up of mushroom-shaped fibrillar adhesive microstructure: contact element behaviour; *Journal of the Royal Society interface*, 2007



Michael Varenberg



Stanislav Gorb

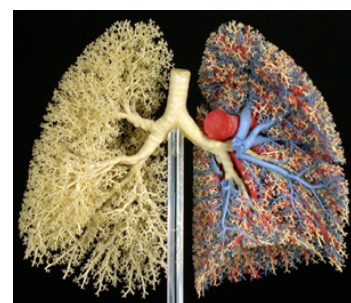


# Upcoming Event: Biomimicry's Climate-Change Solutions

Together with Bioneers, The Biomimicry Institute is pleased to convene the first-ever conference on solutions to climate change inspired by natural technologies. Keynote speakers include David Orr and Janine Benyus, followed by five panel discussions ranging from bio-inspired alternative energy to social investment. Join us for this unprecedented event to discuss the bio-inspired technological innovations helping us mitigate and adapt to a changing world, from the key researchers and business people leading the way.

PLEASE JOIN US on **Monday, October 20, from 9:00-5:00** in San Rafael, California. Intensive prices for Non-profit organizations and individuals are \$175; For-profit organizations are \$250. Lunch is included in the price and a reception will be held after 5:00 p.m. Note that Continuing Education Units are available for this intensive.

REGISTER FOR "**BIOMIMICRY'S SOLUTIONS TO CLIMATE CHANGE**" AT: <http://www.bioneers.org/node/2617>



## Calendar of Public Events

Date	Location	Event
Sept. 9-11, 2008	Leavenworth, WA	<a href="#">Biomimicry for Sustainable Design</a> <a href="#">Discovering a World of Solutions Inspired by Nature</a>
Sept. 25, 2008	Reading, UK	<a href="#">BIONIS 2008 - Commercial Biomimetics</a>
Sept. 26, 2008	Reading, UK	<a href="#">Biomimetics 13 – What's New in Biomimetics?</a>
Oct. 4, 2008 to Jan. 25, 2009	New York, NY	<a href="#">(ASCD): Art, Science &amp; Technology - Digital'08</a>
Oct. 10-12, 2008	Changchun, China	<a href="#">The 2<sup>nd</sup> International Conference of Bionic Engineering</a>
Oct. 12-16, 2008	Cetraro, Italy	<a href="#">Sensors and Sensing in Biology and Engineering</a>
Oct. 14-18, 2008	Nanjing, China	<a href="#">International Symposium on Nature-Inspired Technology</a>
Oct. 16-17, 2008	Missoula, Montana	<a href="#">2008 MEA-MFT Educators' Conference</a> (K-12 workshop on Oct. 16)

Date	Location	Event
Oct. 16-19, 2008	Minneapolis, Minnesota	<a href="#">ACADIA 2008: Silicon + Skin, Biological Processes and Computation</a>
Oct. 17-19, 2008	San Rafael, California	<a href="#">Bioneers 2008</a>
Oct. 20, 2008	San Rafael, California	<a href="#">Biomimicry's Climate-Change Solutions: How Would Nature Do It?</a>
Oct. 23-24, 2008	Luzern, Switzerland	<a href="#">Mailk MZSG—Bionik im Management</a>
Nov. 19-21, 2008	Boston, MA	<a href="#">Greenbuild (Boston) - closing keynote</a> by Janine Benyus and E. O. Wilson, <a href="#">YL08 - Beyond Platinum: Revolutionary Green</a> with Dayna Baumeister
Dec. 9-12, 2007	Sanya, China	<a href="#">International Workshop on Mechanics and Biomimetics of Biomaterials &amp; Animal Locomotion</a>
Dec. 14-17, 2008	Bangkok, Thailand	<a href="#">2008 IEEE Int. Conf. on Robotics and Biomimetics</a>





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“Biomimicry (from *bios*, meaning life, and *mimesis*, meaning to imitate) is a new science that studies nature's best ideas and then imitates these designs and processes to solve human problems. Studying a leaf to invent a better solar cell is an example. I think of it as "innovation inspired by nature."

The core idea is that nature, imaginative by necessity, has already solved many of the problems we are grappling with. Animals, plants, and microbes are the consummate engineers. They have found what works, what is appropriate, and most important, what lasts here on Earth. This is the real news of biomimicry: After 3.8 billion years of research and development, failures are fossils, and what surrounds us is the secret to survival.

Like the viceroy butterfly imitating the monarch, we humans are imitating the best and brightest organisms in our habitat. We are learning, for instance, how to harness energy like a leaf, grow food like a prairie, build ceramics like an abalone, self-medicate like a chimp, compute like a cell, and run a business like a hickory forest.

The conscious emulation of life's genius is a survival strategy for the human race, a path to a sustainable future. The more our world looks and functions like the natural world, the more likely we are to endure on this home that is ours, but not ours alone.”

[A Conversation with Janine Benyus](#)

[BioInspired!](#) is published quarterly and is posted on a public-access [Weblog](#) hosted by TypePad. For those of you familiar with RSS Readers, TypePad supports various feed formats (look for the [Subscribe to this blog's feed](#) link in the right navigator).

Comments can be posted on the newsletter Weblog. At this time, the TypePad RSS feed does not deliver comments.

If you wish to subscribe to this newsletter, please complete the [E-newsletter sign-up](#) form.

Last, but not least, please send any feedback or comments to:

[Norbert Hoeller](#)



## Clippings, Resources and Events

Four public-access Weblogs hosted on TypePad are now available to share information of interest to the Biomimicry Community.

- [Clippings](#): short articles relating to Biomimicry.
- [Resources](#): pointers to more extensive information.
- [Events](#): workshops and relevant conferences.
- [BioInspire](#): **NEW** Twenty-six issues of John Mlade's monthly magazine published between January 2003 and July 2005

These Weblogs can be monitored with your favorite RSS Reader. Anyone can post comments. Please be aware that TypePad requires an e-mail address and will display this address to people viewing the comment. Each Weblog has a 'sticky' post at the top with suggestions on how to reduce the impact of getting Spammed.

Contributions of clippings, resources and events are greatly appreciated! Please see the note at the top of each Weblog for instructions.

Thanks, Norbert Hoeller

### A CALL TO TEACHERS AND STUDENTS OF BIOMIMICRY ~

If you are integrating biomimicry into your teaching or learning, we want to hear about it! Just fill out the on-page form you'll find on the web at <http://sinet.ca/tinc?key=zkJeYXyN&formname=BioEducation>. When you're done filling out the information, you simply click on "ok" (lower right) and you're done. Thanks in advance!