



BIOINSPIRED!

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THE BIOMIMICRY INSTITUTE

Biomimicry Educators Workshop 2007: An Overview in a Nutshell (*Sam Stier*)

Sam Stier recently joined the Biomimicry Institute as a Director of Education, primarily focusing on the K-12 program.

Nutshells are pretty neat things. They package for transport, in space and time, an entire plant's unfolding and resource acquisition instructions (since I'm writing this around lunch time, I might also mention that many of them are also good to eat). There is a company that is even developing a helmet based on a hazelnut, since part of the package function of a nutshell involves often brilliant design ideas for cushioning those precious contents. A nutshell of another kind that I like is one that Janine Benyus has said of biomimicry: "Biomimicry is the conscious emulation of life's genius." As I was thinking about this newsletter just the other day, I thought, if

biomimicry is the conscious emulation of life's genius, then – in a nutshell – what is education?

Perhaps education is the conscious attempt to pass the best lessons of one generation on to the next. Biomimicry, surely one of these best lessons, presents then an important educational challenge: how best to pass this compelling idea on? This question was the focus of the Biomimicry Educators Workshop held at Flathead Lake in Montana this past July. Some twenty-five educators gathered together beside the sparkling residue of a Pleistocene glacier, now the largest freshwater lake in the western U.S., to discuss the future of biomimicry education: what has been working, what has not, and what is needed to make progress.

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Photo by Spiralz

Photo by Andrew Lewis

As John Lennon has said, life is what happens to you while you are busy making other plans. A less explicit but very real additional goal of the workshop was to create more cohesion and synergy amongst the various individuals who are doing biomimicry education on their own, without any external support. It became quickly evident during the workshop that none of these participants really needed extra support. These were the kind of individuals who knew a good thing as well as good pedagogical tool when they saw it. Nor were they afraid to try something fresh and innovative in their classrooms.

However, we did not just pack up and all go home upon realizing this! After all, there is no telling how much more we all could accomplish with a little support and interaction. Indeed, almost immediately the ideas were flying between Institute staff and workshop participants. The interaction felt good... it felt darn good. One could almost watch potential rising before us, like a new volcano from the ocean floor, and all of us knew that something larger than ourselves and our individual efforts at biomimicry education was happening.





An Overview in a Nutshell (continued)



After attending a workshop like this, one realizes – in an age of e-mail and teleconferencing – just how important these face-to-face encounters really are. Although e-mail allows us to connect with more people in more places, it can lack -- well -- humanity. As we tackle larger and more daunting challenges,

face-to-face meetings not only facilitate communication but also turn “contacts” into people, and in the end, people are behind everything we succeed at.

In the next several articles as well as in the next issue of the *BioInspired! Newsletter*, you will meet some of these people, and you will hear their insights into the educational challenge that biomimicry presents us with.

But we hope you will not stop there, because we would love to hear your ideas as well! Drop us a line, give us a call, and let us know what you’re thinking. Or better yet, drop by our office in Missoula, Montana for a visit, face-to-face.



[Sam Stier](#)

Biomimicry Education Vision (*Tom McKeag, Brent Nelson*)

Tom McKeag teaches the Applied Biology for Designers and Artists course at the California College of the Arts, San Francisco, California, and a Biomimicry course for gifted elementary students in the Dixie School District, Marin County, California.

Brent Nelson is a National Academy of Engineering CASEE postdoctoral fellow, studying the use of bio-inspired design as an education tool within biology and engineering in affiliation with the Center for Bio-Inspired Design at the Georgia Institute of Technology.

Two groups took on the topic of defining the basic goals or vision of biomimicry education. It produced a particularly lively discussion among the members of group two. The passion of the debate seemed fitting, both for the critically important topic and the diverse academic group present. The debate was pitched between two camps: the “heart and soul” group and the “just the facts” side.

The “heart and souls” felt that caring for the earth was paramount and all endeavors that do not are, a priori, not biomimetic. Biomimicry, by definition, means operating like Nature and Nature, of course, would not harm itself. Their passion for this stewardship brought them to their involvement with this subject, and they felt that this philosophy should not only be overtly expressed in the vision statement, but given prime importance.

The “just the facts” side felt that there is a great range of biomimetic activity going on in the world and it should all be included in the vision statement whether it meets the philosophical test of sustainability or not. While sympathetic to the philosophy of the other group, they recognized the importance of work that was not motivated by such concerns. They thought it would be limiting to exclude important scientific and educational work that was done from other philosophical perspectives.

All of the members of group one would best be described as fitting in the “heart and souls” category, as the integration of sustainability within the biomimicry vision was universally agreed upon by the members of group one. Within group one, the primary debate centered on the niche that biomimicry could play within the broader sustainability movement. After much debate, the group settled on two primary aspects. First, biomimicry may reach certain types of people that would not be engaged or inspired by other typical lessons, capturing the imagination rather than just making a moral appeal. Second, biomimicry can send a positive message of hope for building a better world by saying “let’s solve this: nature has done it already” rather than reinforcing the gloom and doom dissatisfaction with our current unsustainable practices.



Biomimicry Education Vision (continued)

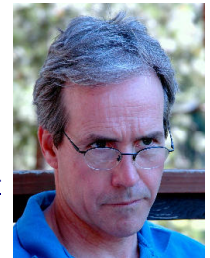
After agreeing upon a general vision of using biomimicry to foster sustainability, the members of group one then turned their attention to the question of how to use biomimicry within educational outreach. Three general levels of educational outreach were identified:

1. Inspire a general awareness and wonder of the natural environment, reaching out to everyone in all walks of life. The goals of the first level include encouraging humility and respect for nature, demonstrating the interconnectedness between humans and our environment, and conveying a sense of hope for a better solution – recognizing that technical challenges can be solved in sustainable ways.
2. Encourage designers to utilize biomimicry as a design tool. The goals would include demonstrating that biomimicry can be useful, as well as continuing to build an appreciation and awe for the natural world.
3. Encourage and develop true biomimics: people who use biomimicry in daily practice. The goals would include training biomimicry educators (at all educational levels), encouraging and equipping technical researchers to study biological organisms and apply the discovered principles to technical

challenges, and supporting designers of all types who seek sustainable biomimicry solutions.

All the participants expressed their appreciation for other opinions and agreed that their differences were clearly reconcilable. To this end, Craig Tovey of Georgia Tech has penned an excellent draft of the vision statement that joins these two views. Getting this statement right and fitting for all is important for a number of reasons: it will provide our inspiration and our ideal for practice; it will form a bond between us in the shared values it expresses and it will forge focused action towards shared objectives.

All are exciting ideas for our fledgling academic community.



[Tom McKeag](#)



[Brent Nelson](#)

Biomimicry Information (Denise DeLuca)

Denise DeLuca, Masters of Science in Civil Engineering and LEED-AP certified, recently joined the Biomimicry Institute as 'Outreach Director'. She is also developing a Biomimicry Handbook for the Institute.

Our mission to “naturalize biomimicry in the culture by promoting the transfer of ideas, designs, and strategies from biology to sustainable human systems design” led these working groups to ask “*what* information should we be transferring, and *how* should we transfer it?” In this case, we were focusing on how we should collect, share and disseminate educational information and materials with the public, educators and repositories of teaching materials.

There were enough excited people to generate two working groups to tackle this issue. The first group focused on the kinds of information we need to share and then the functions that the Institute could play. This group’s ideas are summarized below:

What kinds of information are we talking about?

- Successful teaching strategies and materials
- Unsuccessful teaching strategies and materials
- Assessments and assessment methodologies (for teaching biomimicry)
 - How do we know if our teaching is successful?
 - How do we know if teaching biomimicry changes the way students think and act in the future?
- Biology-taught-functionally (BTF) modules or whole-course material for various target audiences (biologists, engineers, etc.)
 - It was agreed that BTF is a key part of teaching biomimicry and there is very little out there for teachers to draw upon

What should the function of the Biomimicry Institute be?

- A virtual gathering place, providing a web-based discussion forum with topic threads
- A connector for prospective students to teachers, and teachers to experts
- An educator, providing a biology-taught-functionally course run through the Institute, accredited by Montana State University, and built with collaborating partners





Biomimicry Information (continued)

The second group focused on What, How and the process for moving forward.

What

- Curriculum (annotated with teachers' notes)
- Lesson plans
- Classroom and outdoor activities
- Syllabus/programs
- Journal articles
- Images
- Animal/design cards ("creature cards")
- PowerPoint presentations (annotated with extensive speaker notes)
- Video clips
- Contacts to others (similar programs)
- Alternative perspectives
- Resource lists
- Descriptions
- Searchable links
- Help bridge between disciplines

How

- Web upload capability
- Easily downloadable
- Highly searchable

- Add tags, key words, or create categories
- Add comments
- Show what is most current

Process

- 1st stage = gather raw information and share among advisors
- 2nd stage = clean-up information and edit into a familiar format
- 3rd stage = make information available via open source (Wiki), allowing that process to provide feedback
- 4th stage = make polished information public via website

After the education workshop, we set up a Wiki that can be used by the education meeting attendees to begin gathering information. The Wiki is up and running and slowly becoming populated as the education group becomes comfortable with the tool. We look forward to working with contributors to eventually move these valuable innovative materials to our website and make them available to the rest of the biomimicry community.

[Denise DeLuca](#)



Biomimicry: A Tool for Engagement in K-12 Education (Hilary Staples, Margot Higgins)

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

Margot Higgins is a PhD student in Cognitive Development at UC Berkeley.

The group of educators who teamed up to brainstorm about biomimicry in K-12 education included Sam Stier (the Biomimicry Institute's K-12 Director), Hilary Staples, Margot Higgins, Jeremy Eddy, Tom McKeag and Janine Benyus. Each of us was bubbling with ideas and excitement. Once the brainstorming of projects began to flow the enthusiasm was contagious. Many of us had been personally inspired by moments working with kids and witnessing their resulting enthusiasm and creativity ignited by the ideas of biomimicry. Nevertheless, we agreed that there are many hurdles to jump in order to make biomimicry a widespread concept in K-12 curricula.

Many public school teachers are constrained by national teaching standards; many are being asked to teach from No

Child Left Behind scripts. Others are overwhelmed by increasingly large classrooms and have little time to create new lesson plans. Certainly, biomimicry can be tied to lessons in adaptation, evolution, and other topic areas. However, the ultimate goal would be to get biomimicry into national science standards. In order to come up with positive solutions to meet these challenges, the working group chose to focus their workshop in three different areas: access points, inspirational activities, and what sets us apart as biomimicry educators.

The first issue we chose to tackle was access points, in other words, how do we get the word out to K-12 teachers? One direct path is to train the educators. This can be accomplished through teacher workshops, creating lesson plans in education journals or teaching manuals. Contacting schools and teachers is often challenging, but we discussed the idea of presenting the concept at national teacher's conferences, such as the National Science Teachers Association or teacher's union meetings. We agreed that schools which pride



Biomimicry: A Tool for Engagement in K-12 Education (*Hilary Staples, Margot Higgins*)

themselves in environmental or sustainability-based education are ripe for integrating biomimicry, and would be a great place to begin. In addition we could tie the concept of biomimicry into existing programs such as the Jason Project or Project Learning Tree. From these programs we could test out ideas, branch out and gain contacts to other educators.

Activities which engage students outside of the classroom can provide another access point. After school design programs, environmental clubs, or even including biomimicry in the design problem suggested by an organization such as “Odyssey of the Mind” would expose students to biomimicry without “adding one more thing” to a classroom teacher’s curriculum. Certainly, integrating biomimicry as subject

matter in reading and language arts textbooks or children’s magazines is another, albeit less direct route, to instill biomimicry in the common vocabulary of our youth. In fact, Hilary has already successfully incorporated the concept in publishing a lab manual for Environmental Science courses (G. Tyler Miller’s, [Living in the Environment, 14th Edition](#)). An additional education tool will be the children’s music album, which is being produced by Missoula based folk singer Amy Martin on behalf of the Biomimicry Institute. Enhanced by an accompanying curriculum guide, the album will distill the concept of biomimicry into an accessible and entertaining format for a diverse group of listeners including teachers, parents and siblings.



In the San Francisco Bay area, Tom McKeag and Jeremy Eddy are also cultivating fertile ground by providing training for outdoor educators and naturalists. These teachers often work with a different school group each week and are always looking for new ways to engage their students with the natural world. They are exceptionally receptive to the ideas of biomimicry and are not usually restrained by specific curriculum standards. Other ideas which could be designed and implemented at schools and institutes included the creation of biomimetic nature trails, gardens, labyrinths, or scavenger hunts. One way to aid educators in the creation of these spaces would be the creation of ‘biomimetic organism cards’. These could have an image from the natural world on one side and biomimetic information on the other. The cards could also be used to create a temporary nature walk, or an “each one teach one” walk with students. If a teacher could search by location, they could find an appropriate walk for

their bioregion and would not have to be a trained naturalist to accomplish this ‘field trip’. Highlighting the biomimics which are common to gardens or classroom aquariums and terrariums would allow schools without access to nature’s preserved spaces to create an educational space for the school community. Another idea is to take the Life’s Principles and paint them on rocks or stepping stones to be placed throughout a garden. Janine even mentioned the idea of creating biomimetic text message scavenger hunt. Biomimicry never ceases to trigger the imagination!

There are probably many educators out there that have already been inspired by reading an article on biomimicry or hearing Janine speak. It is likely that many educators have already created their own curriculum. For example, during the first week of school in San Rafael, Hilary encountered a new teacher who mentioned that he had already included



A Tool for Engagement in K-12 Education *(continued)*

concepts of biomimicry in an outdoor education program. We would love to find a way to reach out to other biomimicry-inspired educators and create a larger community of K-12 educators to exchange ideas. The Institute can help facilitate this community for us, but only if we all strive to expand the conversation.

Please send your ideas, contacts, and personal stories about K-12 education to [Sam Stier](#).



[Hilary Staples](#)



[Margot Higgins](#)

Master's (equivalent) Certificate in Biomimicry *(Dayna Baumeister)*

The Biomimicry Institute in cooperation with the Biomimicry Guild has recognized a growing demand for post-graduate professionals who would like to continue their education in the field of biomimicry. To the best of our knowledge, no formal broad program in biomimicry exists worldwide. As such, we will be offering a 2-year certificate program that addresses this need. We view the course as the equivalent to a Master's program, although currently the course is not affiliated formally with a university, but may be in the future.

The program is designed to give attendees the skills necessary to become practicing biomimics. The course design will be a combination of learning the necessary skills and practicing them in a real world setting. The course is open to those with an undergraduate degree or significant professional experience in any of the following broadly defined fields: biology, engineering, architecture, industrial design, and business. A graduate of the course will have a specialty in their particular background, but will have gained additional skills in the other fields, as well as skills in communication, systems thinking, biomimicry methodology, life's principles, and sustainability.

There is a rigorous application process which will begin in fall of 2007, with applicants chosen in December. The initial class will be limited to 15 participants. The cost of the entire program will be \$10,000, which includes room and board for the on-site sessions, but excludes travel to the site. With the support of sponsoring organizations, we hope to be able to offer merit and need based scholarships.

Over a two year period beginning in Spring of 2008, course participants are required to meet collectively five individual times for five days each time. Each meeting will occur at a

location somewhere in North or Central America. Our first scheduled session is May 15-20th, 2008 in Helena, Montana.

As we have designed the course to be as rigorous as a Master's, the level of work involved during the sessions and between will be rigorous. In between these meetings, there will also be formal home study, on-line courses and group work via virtual interactions. Home study may be both formal and self-study, allowing each individual to address needed learning in fields with little experience. The course will be taught by a suite of experts, led by Dr. Dayna Baumeister in the fields of biomimicry and sustainability with several guest lectures by prominent, world-renowned visionaries.

We anticipate that following completion of the program, participants will be able to market their skills in the field of biomimicry to:

1. obtain meaningful employment in the emerging market for "Biologists at the Design Table"; or
2. initiate their own consulting practice in the field of biomimicry; or
3. engage others within their current organization to begin practicing biomimicry; or
4. incorporate learnings into existing or new education endeavors.

If this program sounds interesting to you, please visit the [Biomimicry Institute](#) website. An update on the course and the application process will be available on-line by November 1, 2007.



Dayna Baumeister



The 21st Century Biologist: a Renaissance Revival? (Cindy Gilbert)

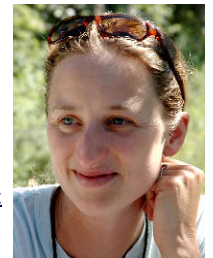
Cindy Gilbert recently joined the Biomimicry Institute as a Director of Education, primarily involved with University programs.

What do Leonardo da Vinci - biologist, writer, artist, architect, engineer - and Michelangelo - artist, poet, engineer - have in common with a contemporary biologist? It was Jeannette Yen, Director of the Center for Biologically-Inspired Design (CBID) at Georgia Tech, who germinated the seeds I had been sowing in my mind on this subject. "How would you define the 21st century biologist?" asked Jeannette of the participants of the Biomimicry Education Workshop.

After decades of training and education to become a biologist, you would think this would be an easy question for me to answer. For me, this question was wrought with expectations, academic silos and preconceived notions. From the perspective of most academic institutions, the answer is fairly straight forward: someone who majors in one specialized area of biology with little to no coursework in liberal arts studies. This definition is inadequate and restrictive, especially when I consider the training of future biomimics. What biologists would be most effective at the design table with professionals from business, engineering, design and architecture? I believe the ideal biologist is someone who is a true generalist; a Renaissance person, if you will.

Clearly, the 21st century biologist is a person with a solid foundation in biological sciences, who is a naturalist at heart, and also understands how humans fit into nature. As Janine Benyus says, someone who is able to "look through taxa with a functional lens", someone who recognizes deep patterns in nature. Strong communication skills (verbal, written and, I would argue, visual) are another defining asset. Being able to translate and transfer ideas across the sciences and to a potpourri of audiences in a manner that is readily understood by everyone is not an easy task, but one that is crucial. Being open-minded, respectful and trusting of other people's viewpoints and expertise, while recognizing that the sum is greater than the parts, is an integral part of being an effective inter-disciplinary team member. Lastly, the 21st century biologist would have experience with research and within the workforce, be good stewards of the environment, and be knowledgeable of the greatest threats to nature. The world's most pressing problems cross the boundaries of traditional disciplines and the most adaptable biologists will too. To answer Jeannette's question, I believe the contemporary biologist is being reborn in the form of a Renaissance revival.

[Cindy Gilbert](#)





Biomimicry in Mexico

Biomimicry is growing in Mexico! We first learned of their efforts when Sichem Rizo, then an industrial design Master's student writing a thesis on biomimetic methodology for designers, attended a biomimicry and design workshop in Costa Rica with Dayna Baumeister and Janine Benyus. This was followed by Denise DeLuca's visit last spring, helping ITESM, the largest university in Latin America (with all its satellite and virtual campuses) bring biology to engineers (see the [June 2007 BioInspired! Newsletter](#)). Since then, Sichem has joined the faculty and begun a new sustainable industrial design program on their campus in Aguascaliente.

In June, Dayna Baumeister was invited to Iberoamericana Universidad in Mexico City to conduct a week-long workshop in Veracruz for 18 professional and student architects, as well as some local entrepreneurs and biologists. The opportunity to take this group of city-dwellers through the desert and jungle really opened their eyes to the possibilities. One group in particular really delved into the principles of compression, tension, and flexibility, identifying deep principles common across nature and subsequently identifying potential applications in the built environment.

Late in August, Dayna returned again to Mexico, this time Monterrey, and in a whirlwind day graciously cared for by her host, Nelly Correa Sandoval, was interviewed on television, gave a keynote lecture to mark the signing of the Earth Charter by ITESM, participated in panel discussion and showed up on the front page of the cultural section of the newspaper! The lecture and the panel discussion were broadcast to all of the ITESM campuses and the television program is sent out to over 140 different stations throughout Latin America. Dayna also met several individuals interested in translating the website and other materials into Spanish.

In an effort to help support these new seedlings, in October, Bryony Schwan will head back down to Mexico City and meet with Sichem, Jorge Kanahuati and Carolyn Aguilar-DuBose from Iberoamericana (who both attended the Veracruz workshop) and hopefully Nelly to help foster the continued growth of biomimicry through collaboration in a country that is incredibly rich with biodiversity and offers ample opportunity to teach and lead students and professionals about the amazing innovations they might learn in their own backyards. ¡Vive México!
Dayna Baumeister

California College of the Arts Press Release

Tom McKeag, senior lecturer at the California College of the Arts and teacher of Applied Biology for Designers and Artists, has announced that he will be joined this fall by a new co-teacher, Dr. David Hammond.

David holds a PhD in Agricultural and Environmental Chemistry and an MS in Energy from U.C. Berkeley and is a consultant for the Biomimicry Guild. He is also the director of research and development of a new company, GO2 Water,

which designs biomimetic wastewater treatment systems.

Jeremy Eddy, for many years the lead instructor of the course, will be pursuing a masters degree at U.C. Berkeley's Energy and Resource Group. Jeremy has graciously agreed to continue his contribution to the class in the form of guest lectures. His skillful teaching is greatly appreciated by students and faculty alike. We wish him the best of luck at Berkeley.

Biomimicry for Designers

The Minneapolis College of Art and Design (MCAD) is offering a five week online course taught by Dayna Baumeister (Ph.D. University of Montana), design consultant and co-founder of the Biomimicry Guild. [Biomimicry for Designers](#) will help designers access information from living systems to inspire sustainable design. The course provides "the basics of biological principles ... a wealth of examples from the natural and designed worlds (and) powerful metaphors and methods for looking to nature as model, mentor and measure in our designs." Sessions run from October 1 through November 2.

[Biomimicry for Designers](#) is being offered as part of the MCAD [Sustainable Design Online](#) program, applicable to designers, brand managers, product planners, buyers and executives in the fields of graphic, packaging and product design. The program provides in-depth, practical knowledge in sustainable design practices. Workshops can be taken individually or as part of a certificate program comprised of 13 credits of required courses and 5 credits of electives.

For more information or to register for this course, please see <http://www.mcad.edu/showPage.php?pageID=1600>.



2008 Institute of Biological Engineering Meeting

The [Institute of Biological Engineering](http://www.ibe.org) (IBE) promotes “broad inquiry in the fundamentals of engineering sciences based on biology ... from molecular to organism to landscape scales. ... IBE is striving to form a nexus of engineers and scientists, professional societies, and industries to inspire designs that capture remarkable features of living systems.”

The 13th annual meeting will be held in Chapel Hill, North Carolina, on March 6-9, 2008. The 2008 [call for papers and posters](#) is now open – abstracts need to be submitted through

the IBE website (<http://www.ibe.org>) by December 1, 2007. Denise DeLuca of the Biomimicry Institute is the session organizer for **Biomimicry: Innovation Inspired by Nature**. For more information about this session topic, please contact me using the link below:

[Denise DeLuca](#)

Biological Approaches for Engineering Conference

**17-19 March 2008
University of Southampton (UK)**

A conference on Bioinspiration and Biomimetics, with particular relevance to engineering is planned for March 2008. Leading scientists, academic researchers, interested parties from the defence industry and business enterprises, committed to this area of science, will be brought together in one location. It is intended to establish new collaborations, identifying strategic areas of high priority for future investigation and explore potential for development. This will be achieved by a single track programme of keynote lectures, poster session, breakout reporting and discussion sessions. An internationally recognised organising committee has been formed to take the conference forward.

Call for papers: Papers are invited on any aspect of Bioinspiration and Biomimetics with the main emphasis being based on the topics listed below. Abstracts of no more than 250 words can be submitted electronically to: BAEC@isvr.soton.ac.uk

Topics: Aerial Locomotion; Marine dynamics; Systems Design and Structure; Sensors and Senses; Communication; Co-operative Behaviour; Cellular Behaviour; Novel Materials; Bio-acoustics; Mechanical and Thermal Devices.

A Conference Proceedings and a Special Issue of “Bioinspiration and Biomimetics Learning from Nature” featuring selected papers will be used to reach a significantly wider audience encouraging discussion on an international level.

The University of Southampton is a natural host for this meeting being one of the top ten research universities in the UK with a turnover of £0.3bn and a research grant income in excess of £120m. It is a centre of international excellence for engineering with all such schools ranked at the highest 5* level in RAE2001. The venue for the conference will be Chilworth Manor (<http://www.chilworth-manor.co.uk/>) which is a 19th century country estate located within the University of Southampton’s Science Park.

Website for further information: <http://www.isvr.soton.ac.uk/bioinspire/index.htm>

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Calendar of Public Events

Date	Location	Event
Oct 1-Nov 5	online	MCAD: Biomimicry for Designers
Mar 6-9, 2008	Chapel Hill, NC	13th Institute of Biological Engineering Conference

Date	Location	Event
Mar 17-19, 2008	Southampton, UK	Biological Approaches for Engineering
Mar 30-Apr 3, 2008	Girona, Spain	Mechanosensors: From Biological to Bionic Systems



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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 [BioFeedback](#) form and check off 'Quarterly Newsletter'.

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

[Norbert Hoeller](#)



Clippings, Resources and Events

Three 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.

These Weblogs can also 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 SPAMed.

Past issues of John Mlade's [BioInspire](#) magazine are posted on ThinkCycle. BioInspire will be migrated to TypePad shortly.

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!