Biomimicry

Getting in touch with 3.8 billion years of wisdom

SHIVA SUBRAMANIAM
shiva@thinkpaperclip.com

What is Biomimicry?

Innovation inspired by nature.

The practice of adapting nature's best "ideas" to the invention of sustainable technologies for people

We don't learn *about* nature; We **learn from nature**.

Biomimicry is….

”..Conscious Emulation of Life’s Genius”

- ***Conscious***: Being intentional
- ***Emulation***: Learning from living things, then applying those insights to the challenges humans want to solve.
- ***Life’s Genius***: Recognizing that life has arrived at well-adapted solutions that have stood the test of time, within the constraints of a planet with finite resources.


ZERO
hours stuck in traffic
685,000,000
number of hours Los Angeles commuters were stuck in traffic in 2013
BIOMIMICRY
INSTITUTE

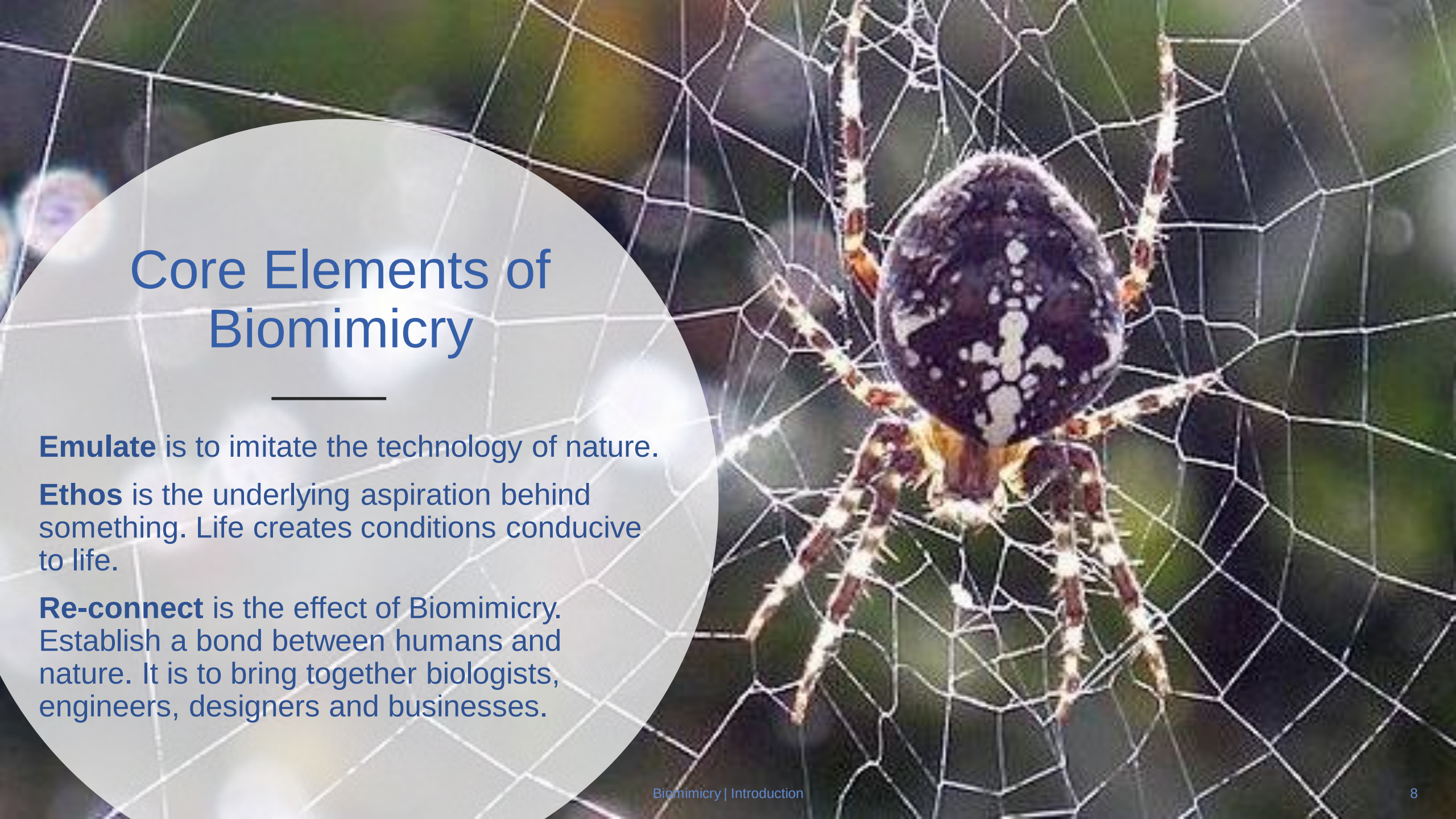
Biomimicry - Energy Technologies

Earth's Operating System

- Limited Water, Atmosphere and Sunlight
- Gravity, Cycles, Dynamic Change

Why Biomimicry?

- We can develop new products, processes, and systems, or improve existing designs.
- Can help us to shift our perspective, see design problems and objectives differently, and uncover “new” solutions to difficult problems.
- Socio economic and ecological pressure
- Transformative innovation
- Save the earth
- Makes perfect business sense
- We need a mentor/teacher - A teacher with 3.8 billion years of wisdom!
- Do we have a choice?



Core Elements of Biomimicry

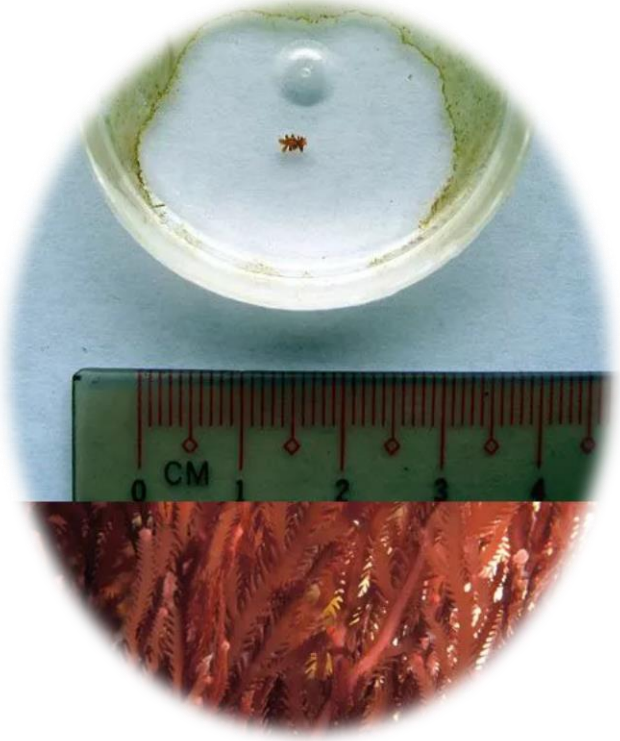
Emulate is to imitate the technology of nature.

Ethos is the underlying aspiration behind something. Life creates conditions conducive to life.

Re-connect is the effect of Biomimicry. Establish a bond between humans and nature. It is to bring together biologists, engineers, designers and businesses.

What are we mimicking?

FORM
Shape, surface or texture (macro or micro)



PROCESS
Operations or behaviours

SYSTEM
Many forms and processes interacting

Biology to Design

You look at nature and abstract the design principle and create a new design.

Discover the part where you get to grips with the organism: What does it do? How does it do it?

Explore the part where you bridge biology and human design: What are the functions and context?

Create the part where you create a design based on the abstracted design principle.

Evaluate the part where you evaluate you design and improve on it. You can be inspired by other living organisms.

Challenge to Design

You work on a challenge and look to nature for help with the solution.

Explore: You scope out the human challenge and identify functions, context and scale. What you want your design to do?

Integrate: Integrate the life principles in your design brief.

Discover: How does nature do what you are proposing to do. For this find natural models that match your challenge's requirements.

Next go outside, research, ask people to look for natural models.

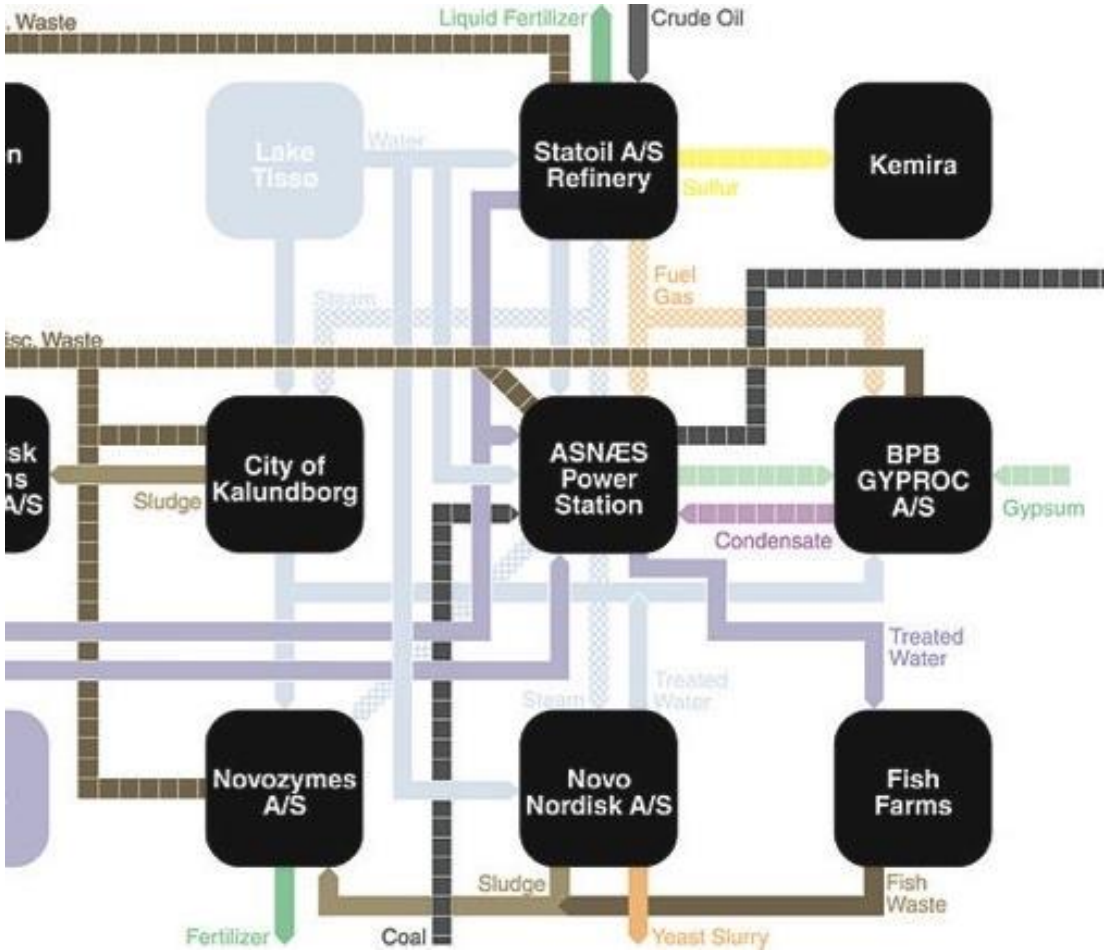
Sort your findings into patterns that repeat or can be used with the taxonomy.

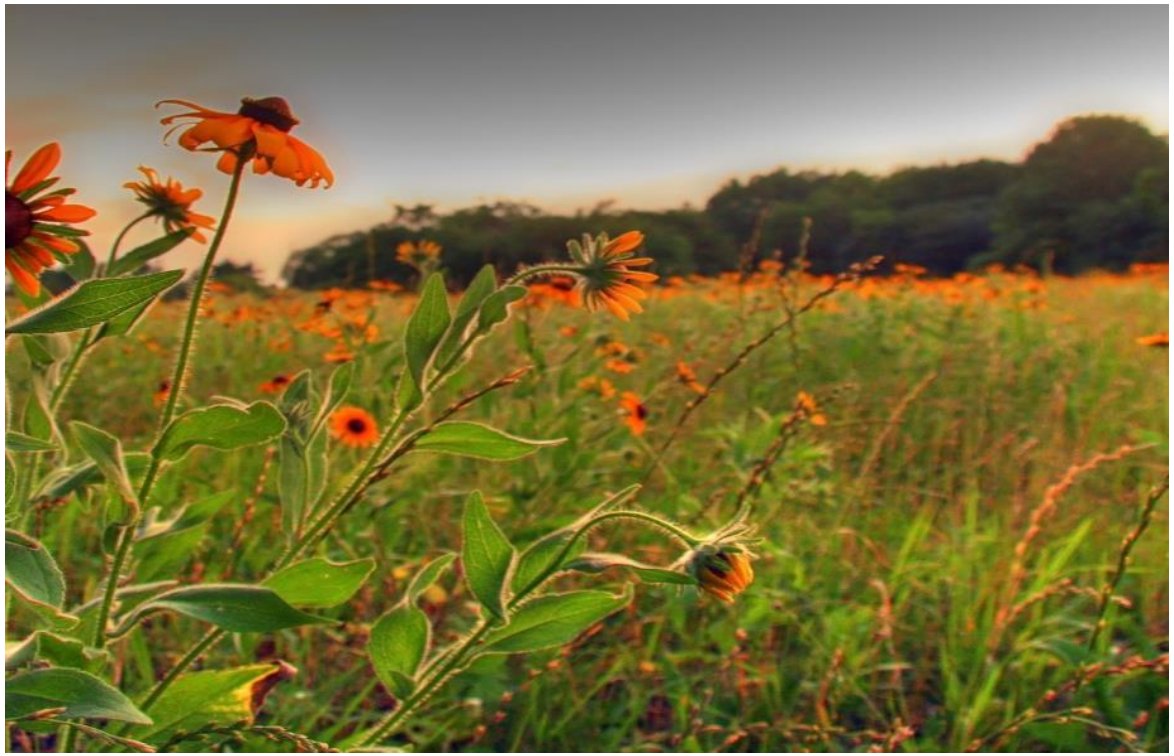
Always remember to consider context and scale.

Shinkansen Bullet Train

Eastgate Centre,
Harare (Zimbabwe)

Kalundborg, Denmark – Industrial Symbiosis

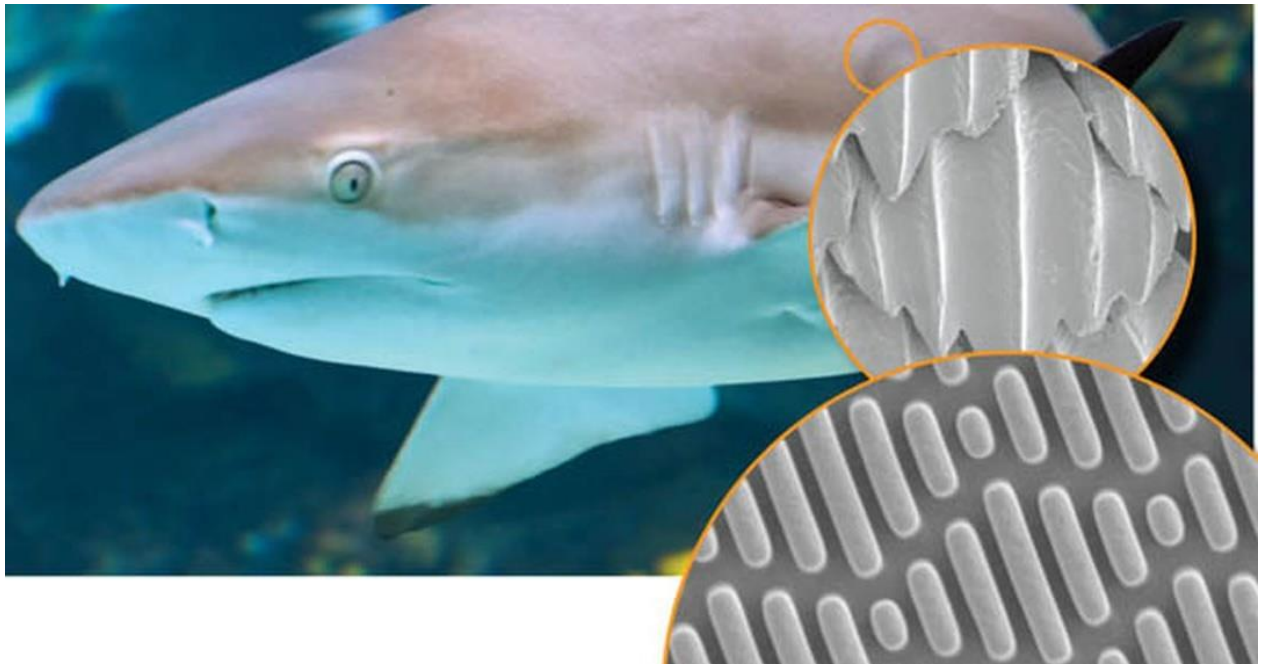




WhalePower - Tubercle Technology

Can Namib Desert Beetles Help Us Solve Our Drought Problems?

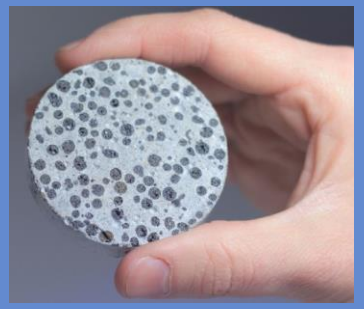
Using Shark Skin To Fight Against Bacteria



Nature’s Unifying Patterns - 1

Nature uses only the energy it needs and relies on freely available energy

Nature recycles all materials



Nature is resilient to disturbances

Nature tends to optimize rather than maximize

Nature provides mutual benefits

Sloth in forest

Nature’s Unifying Patterns - 2

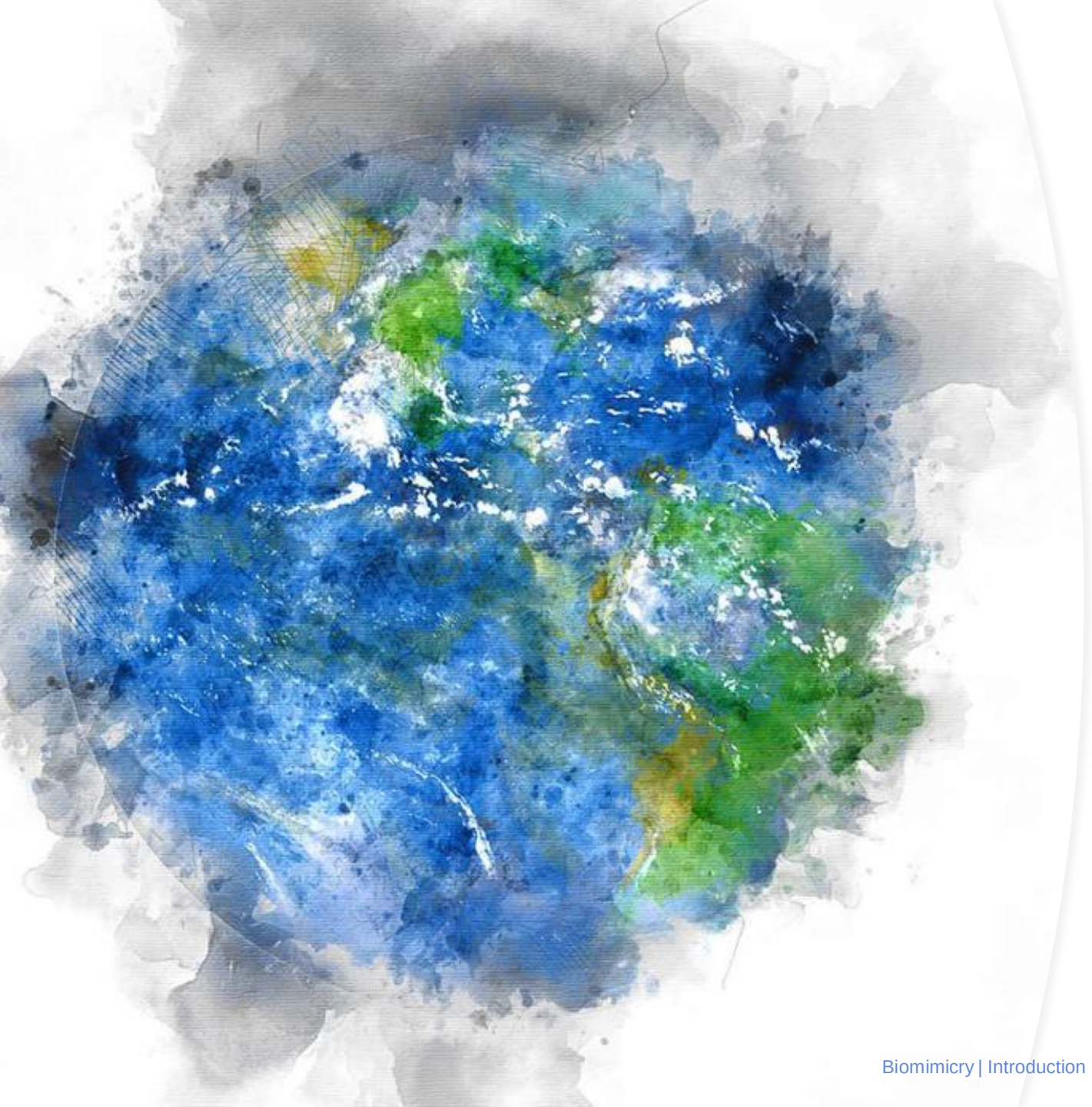
Nature runs on information

Nature uses chemistry and materials that are safe for living beings

Nature builds using abundant resources, incorporating rare resources only sparingly

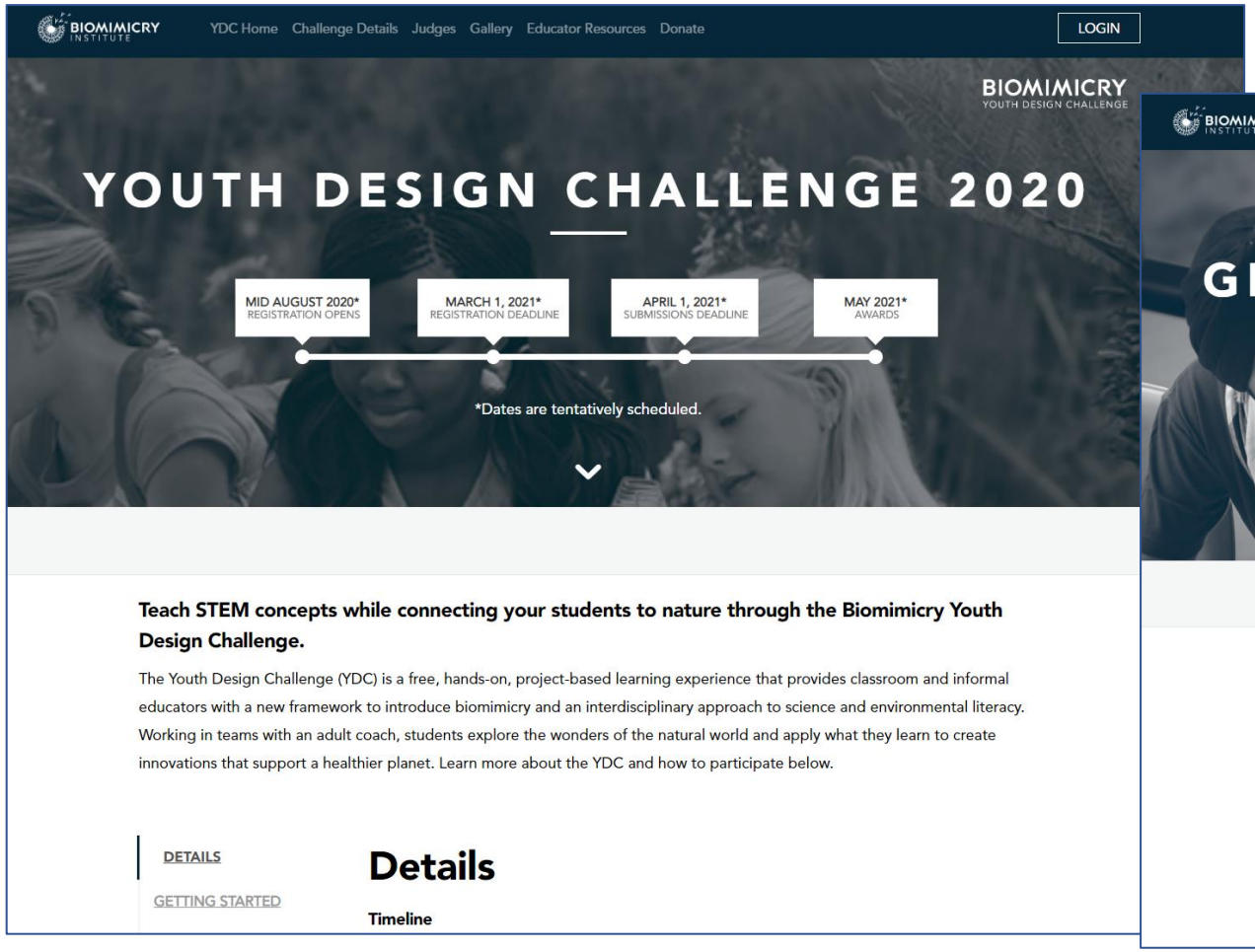
Nature is locally attuned and responsive

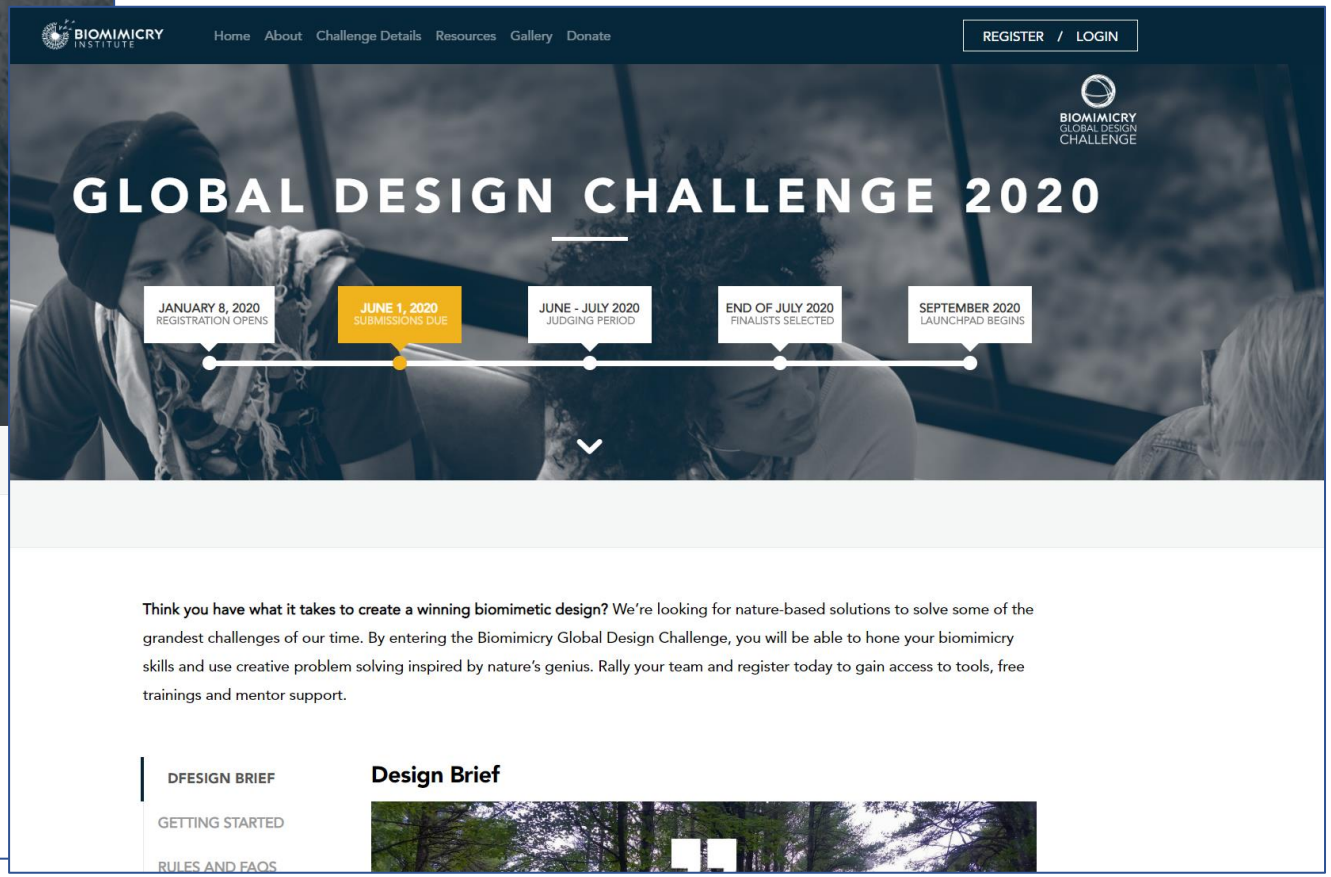
Nature uses shape to determine functionality



Biomimicry Initiatives

- Biomimicry for Entrepreneurs
- Biomimicry for Schools
- Biomimicry for Colleges
- Biomimicry ‘Train the Trainer’
- Biomimicry Virtual Museum
- Biomimicry in Government policy
- Biomimicry Challenge
- Research into Biomimicry



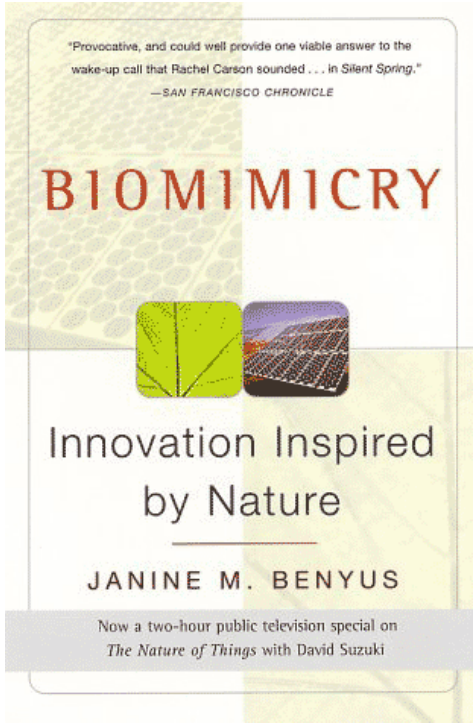


Youth Design Challenge: https://youthchallenge.biomimicry.org/

Global Design Challenge: https://challenge.biomimicry.org/

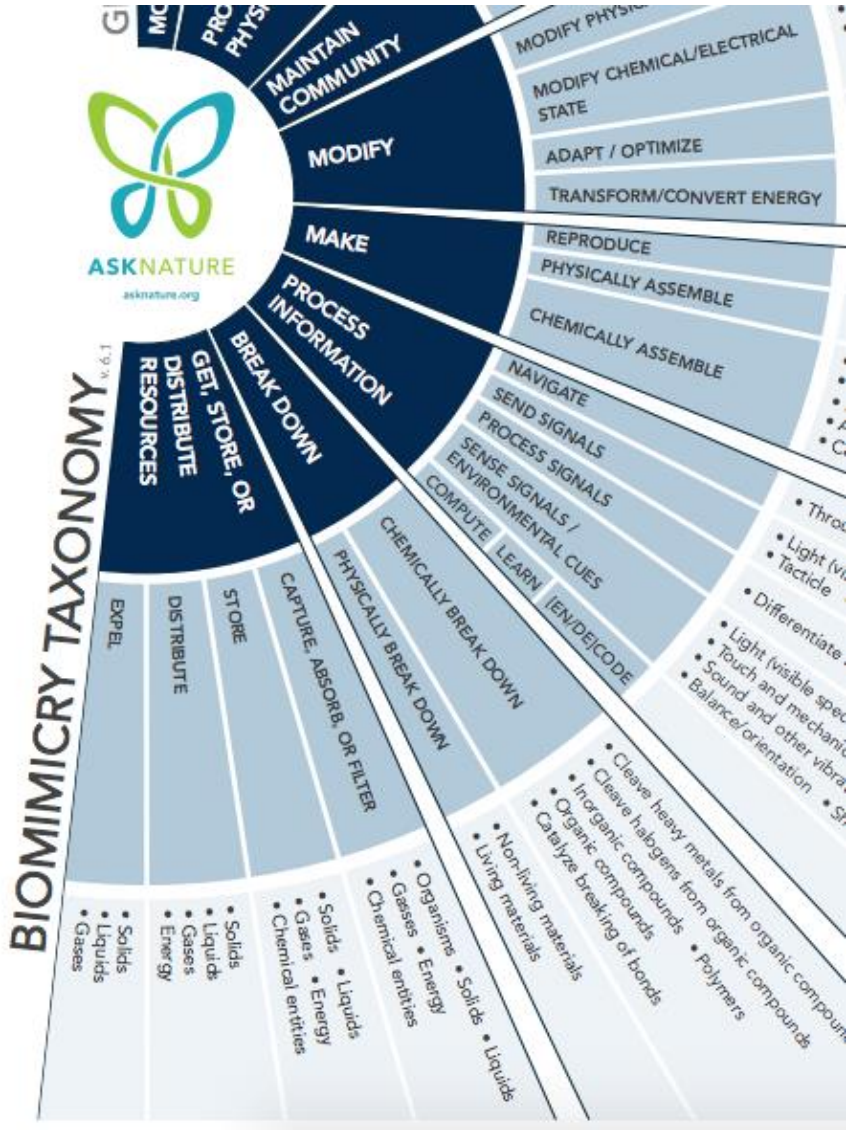
Innovation using Biomimicry

- **Sustaining innovation**: Improves efficiency and prolongs the life of existing systems
- **Disruptive innovation**: Shakes things up or subverts those systems
- **Transformative innovation:** With a longer term aspiration it is possible to disrupt with a purpose. Shifting the whole system over time to a new viable pattern fit for the future.



Janine Benyus

"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…"



Resources & Reference

- Biomimicry Institute: https://biomimicry.org/
- AskNature: https://asknature.org/

Thank you

SHIVA SUBRAMANIAM
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