



Biomimicry  
Germany

an open-platform for research and  
innovation by facilitating an exchange  
between life-scientists & technologists



## Biomimicry Germany

### Website

[www.biomimicrygermany.com](http://www.biomimicrygermany.com)

### Twitter

BiomimicryGER

### Facebook

Biomimicry-Germany-Innovation-Labs

We consult and offer a platform for companies and research facilities to learn and integrate Bio-inspired designs & Biomimicry

Together with experts in the fields of science, engineering, economy, ecology and design, we develop and spread Biomimetic concepts and the methodology in order to establish sustainable innovation in organizations and our society as well as design and test forward-looking products/ systems.

# Biomimicry Germany



Organization for bio-inspired education & innovation



Arndt Pechstein

Daniela Teodosio

Prateep Beed

Morganne Graves

Fabian Feutlinske

Manuel Hernandez

Marc Köppen

Abdeljalil Karam

Paul Hoffmann

Stefanie Klein

Kassandra Hyunh

Jeffrey Reinhold

Johannes Fuchs

Sara Perestrelo

Constance Holman



## Interdisciplinary

# Biomimicry Germany



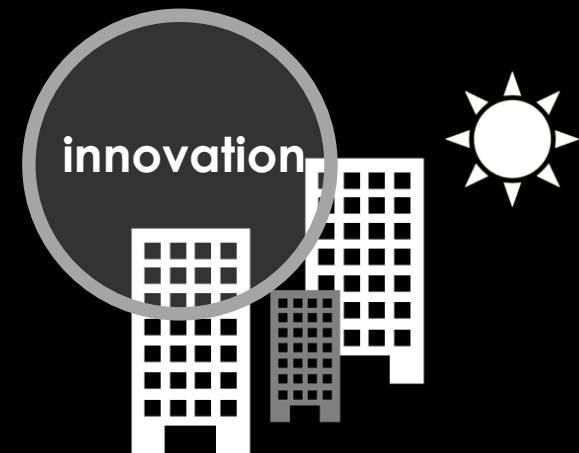
Organization for bio-inspired education & innovation

Nonprofit & public utility



- Academic teaching
- Scientific Training
- B-thinking Workshops

Professionals



- Resilient cities
- Resource efficiency
- Additive manufacturing

# bio-inspired

Nature-inspiration

Abstraction

Sustainability

# bionic

Nature-inspiration

Abstraction

Sustainability

# biomimicry

Nature-inspiration

Abstraction

Sustainability

We use Life's Principles as an 'objective' measure for sustainability



Biomimicry is an emerging methodology  
& tool for sustainable innovation &  
product design in today's world by  
learning from/ about nature.

# Observing nature

*Leaf has two surfaces using the same material for construction*

How can we reduce  
material use still multiply functionality ?





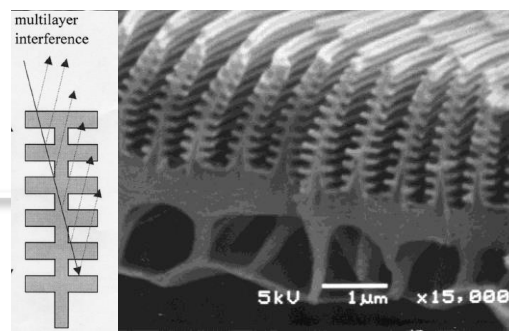
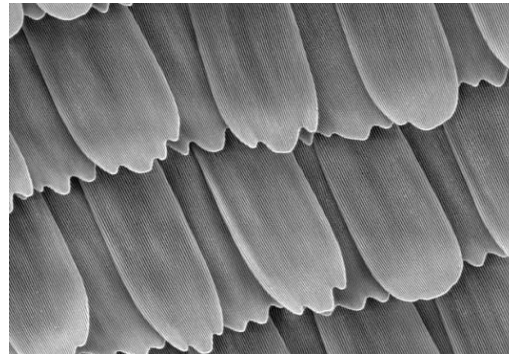


## Gecko versus lotus leaf ?

# Biomimicry

[bios] = life

[mimesis] = emulate



© F. Nijhout\_Duke University | Shanghai-Jiao-Tong-University



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# SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY



2 ZERO HUNGER



3 GOOD HEALTH AND WELL-BEING



4 QUALITY EDUCATION



5 GENDER EQUALITY



6 CLEAN WATER AND SANITATION



7 AFFORDABLE AND CLEAN ENERGY



8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



10 REDUCED INEQUALITIES



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



14 LIFE BELOW WATER



15 LIFE ON LAND



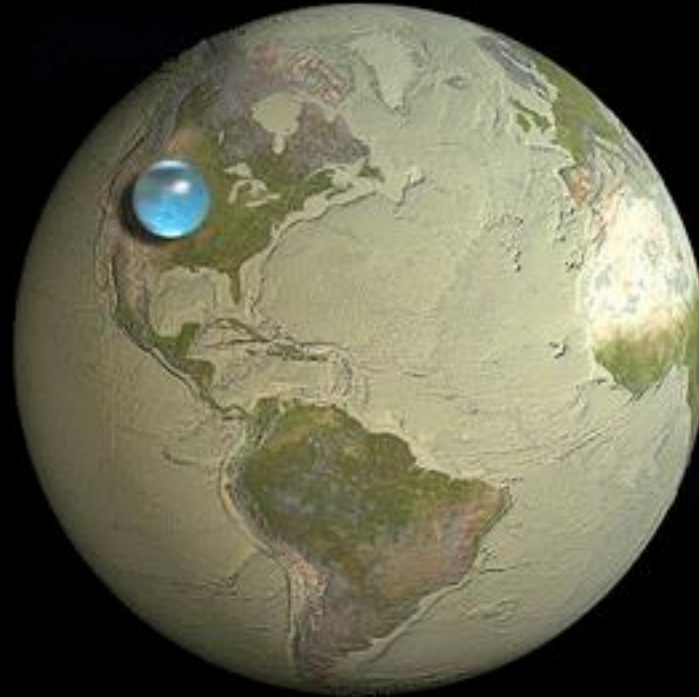
16 PEACE, JUSTICE AND STRONG INSTITUTIONS

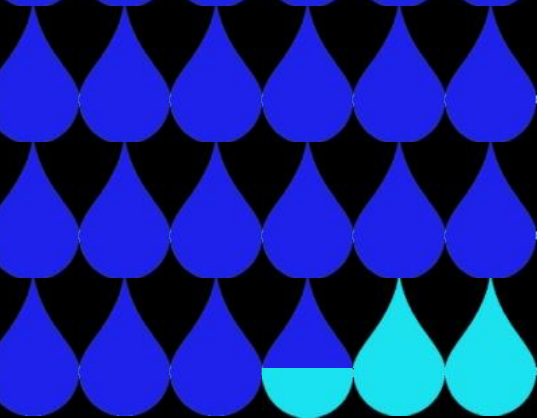


17 PARTNERSHIPS FOR THE GOALS



# Resources: Water

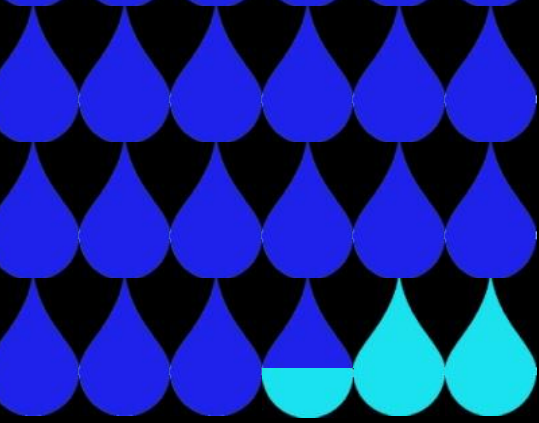




**71%** of the earth  
are covered  
by water



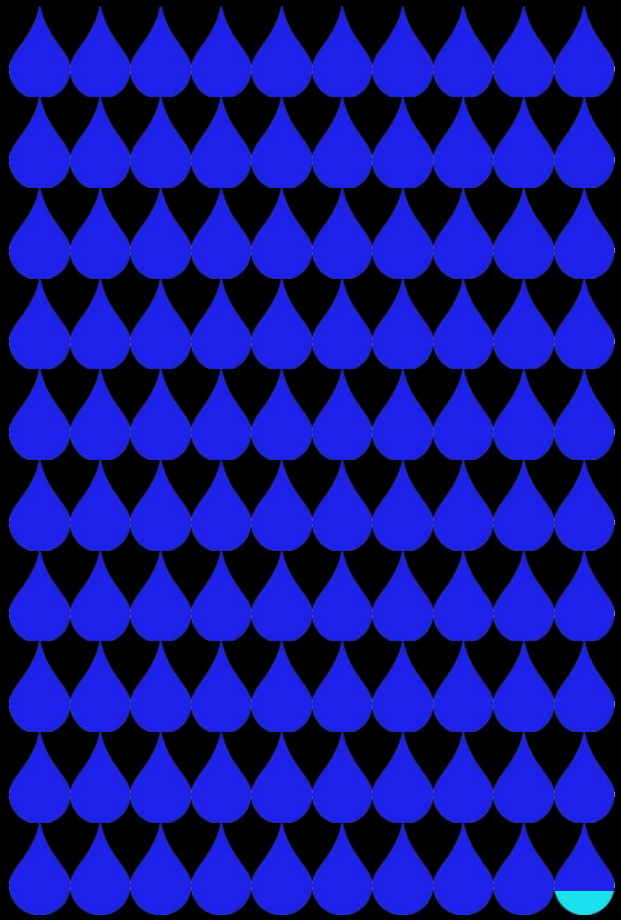
**97.5%** thereof  
are  
**salt water**



our planet contains

only **2.5%**

**fresh water**



From those

**0.3%**  
drinking water

for 7.3 BILLION people...





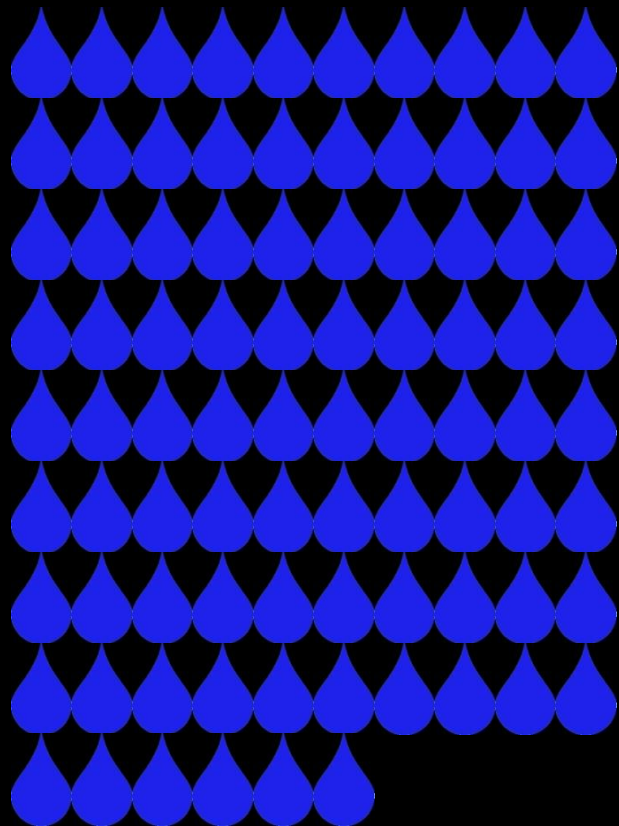


**a Mosambican**

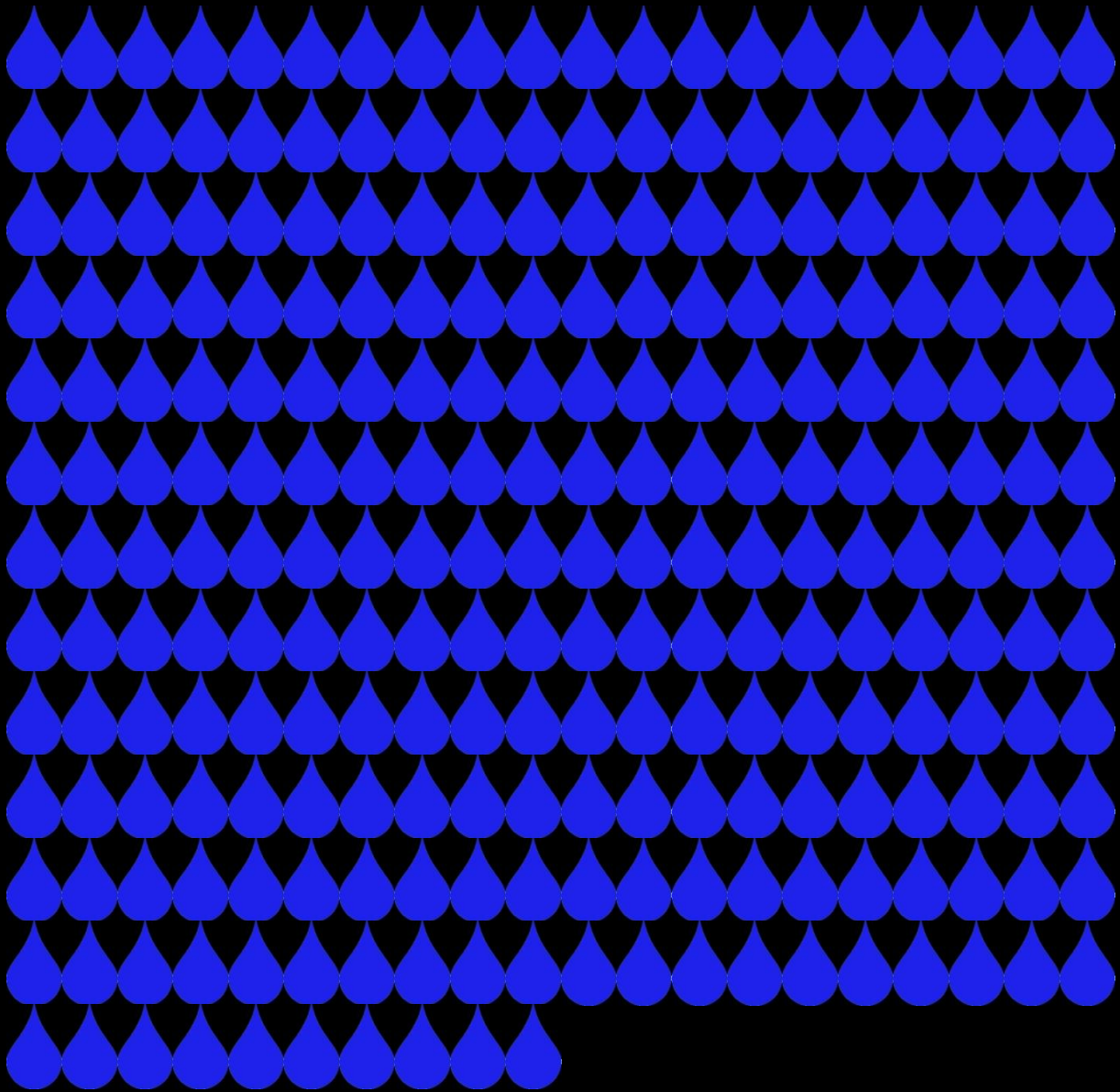
**uses on average**

**4 Liters**


**water**/per day



a  
Chinese 86 liters



250  
European  
Liters



a  
US-American

575 Liters

We use

**140** liters water

for only 1 cup of **coffee**



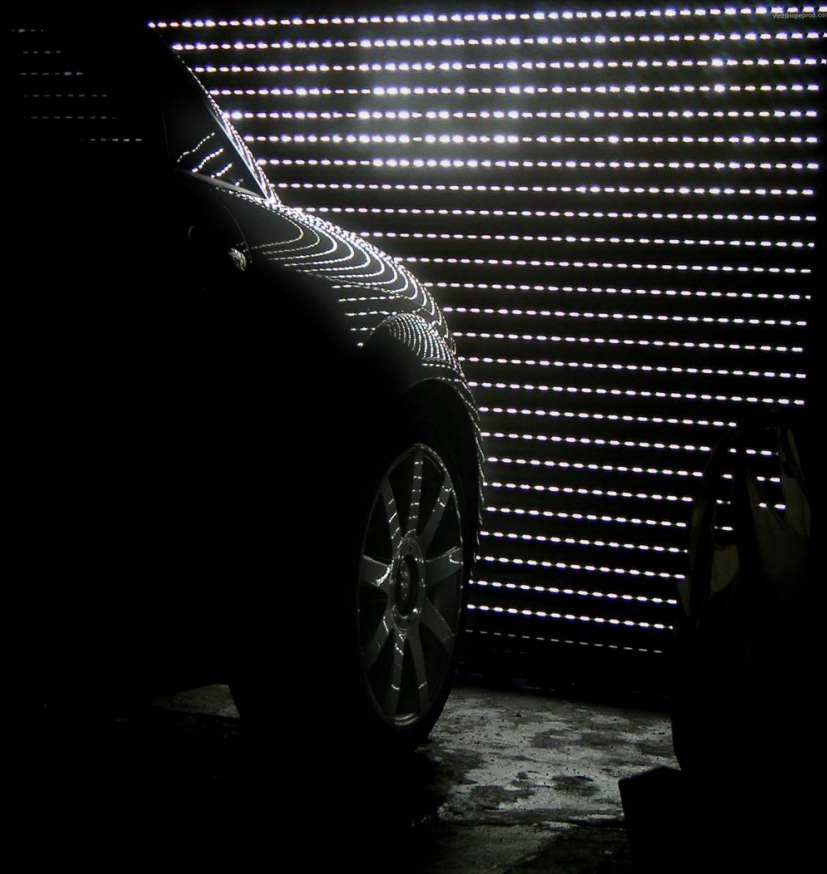
11.000 liters

for a single  
hamburger



**450.000** liters

for the production of ONE car



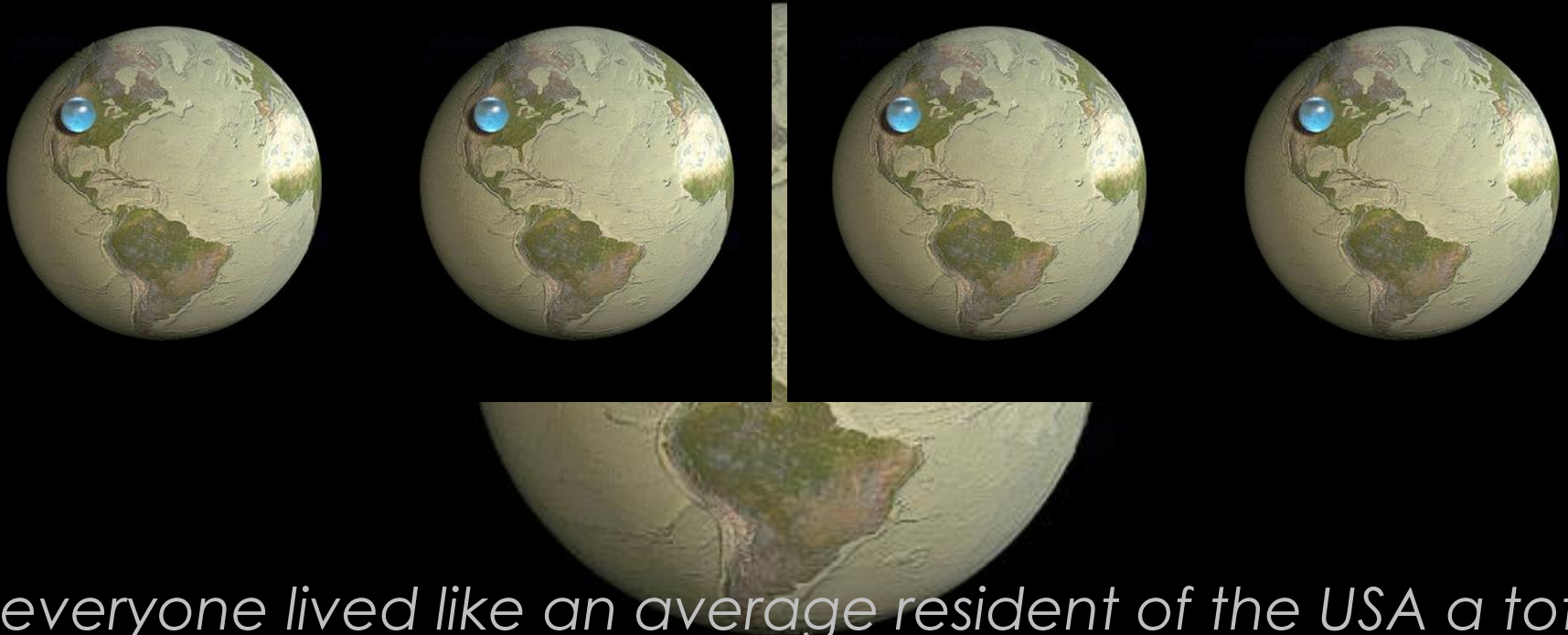
liter

During the 10min of my talk

**3000 MIO** Liters

of water will be used  
in Germany





*„If everyone lived like an average resident of the USA a total of 4 earths would be required to regenerate humanity's annual demand on nature.“*

[WWF, Living planet report 2012]

change the way  
we live, produce and consume

We cannot solve our problems with the same thinking we used when we created them.

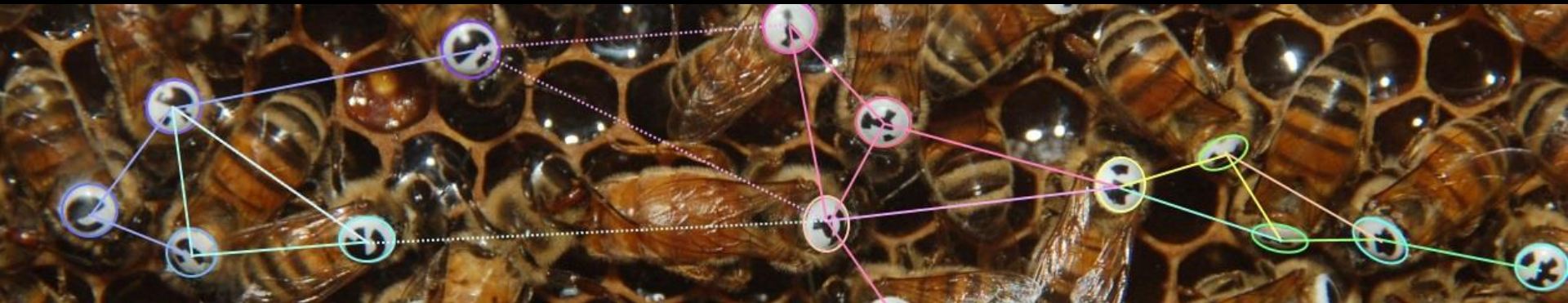
*Albert Einstein*

change the way  
we live, produce and consume

Insanity: doing the same thing over and over again  
and expecting different results.

*Unknown*

# nature as model and mentor



Prof. Tim Landgraf, Research in collective intelligence, machine learning and and biorobotics at Free University, Berlin

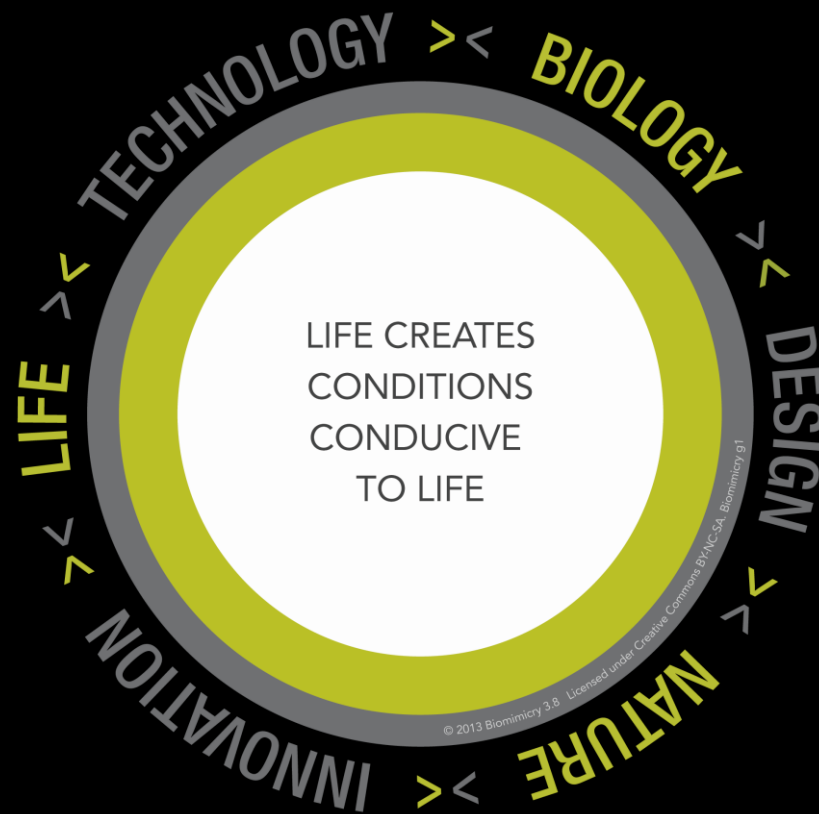
# nature as model and mentor

4.5 billion years - condensed into 12 months



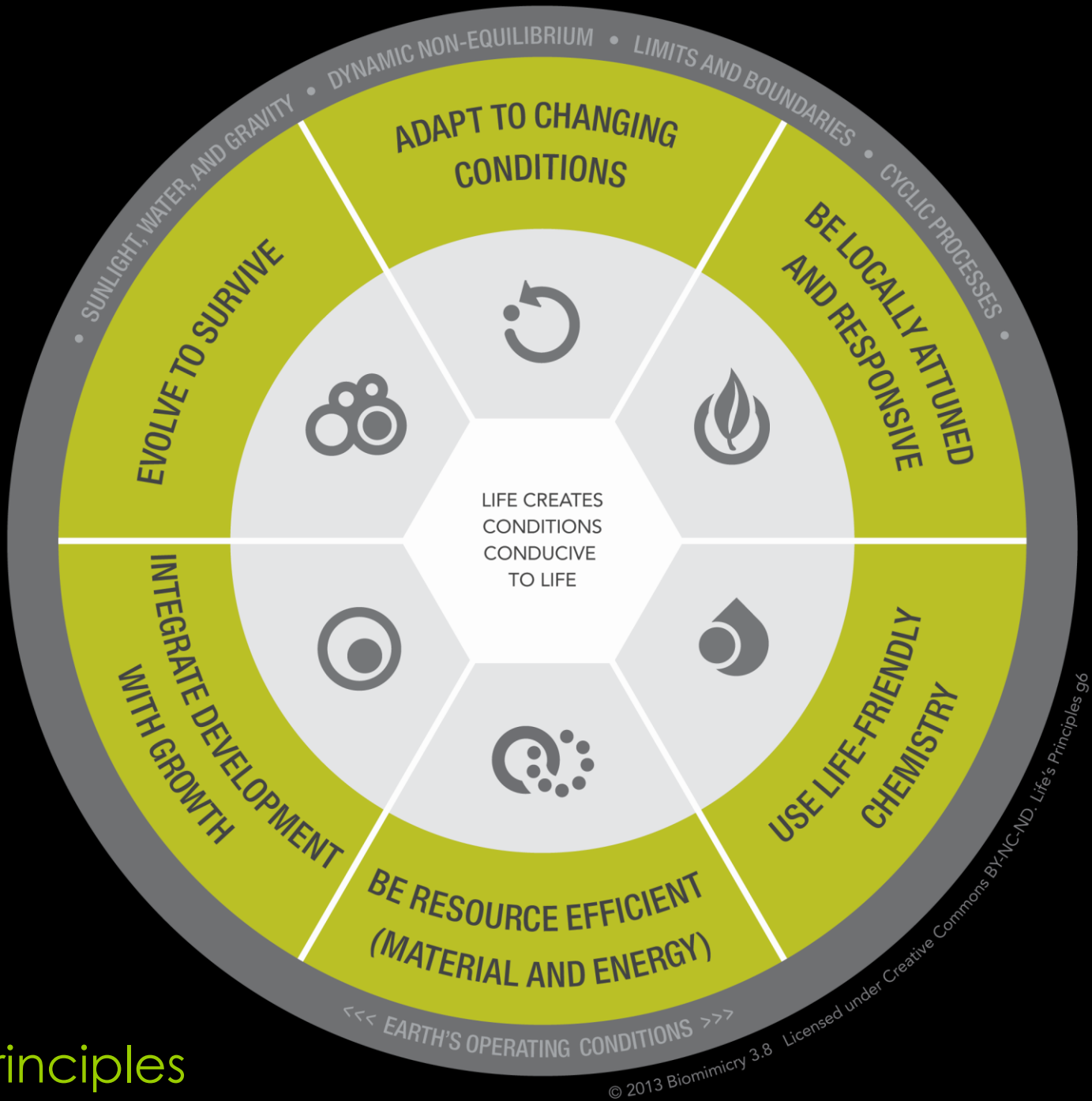
31. Dezember, 23:59:58 | Industrial Revolution

# Designs in the biosphere



form follows function

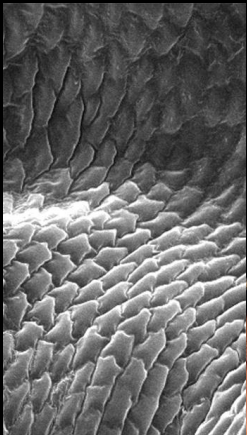
# Sustainable design



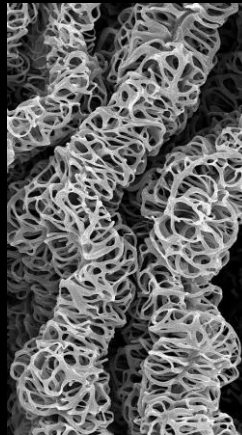
Life's principles

# Nature: multi-functionality in design

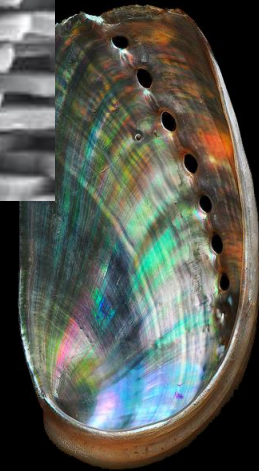
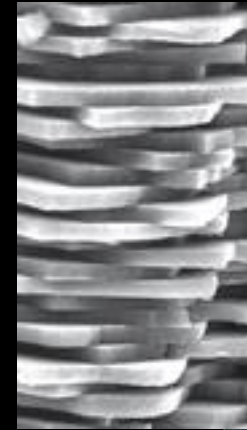
## Chitin



*Insect*



*Plants*



*Shells*



# Biomimicry: abstracting design principles



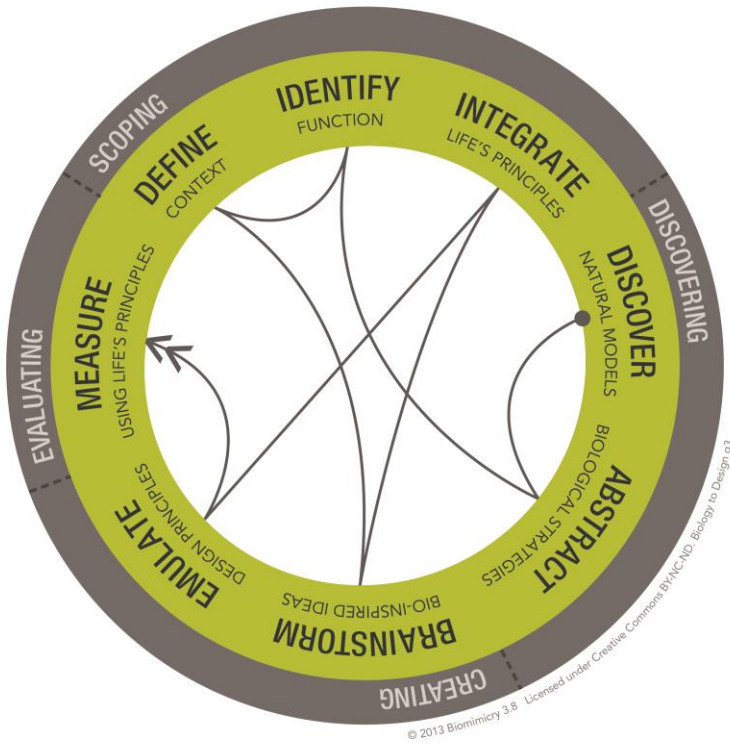
form



process



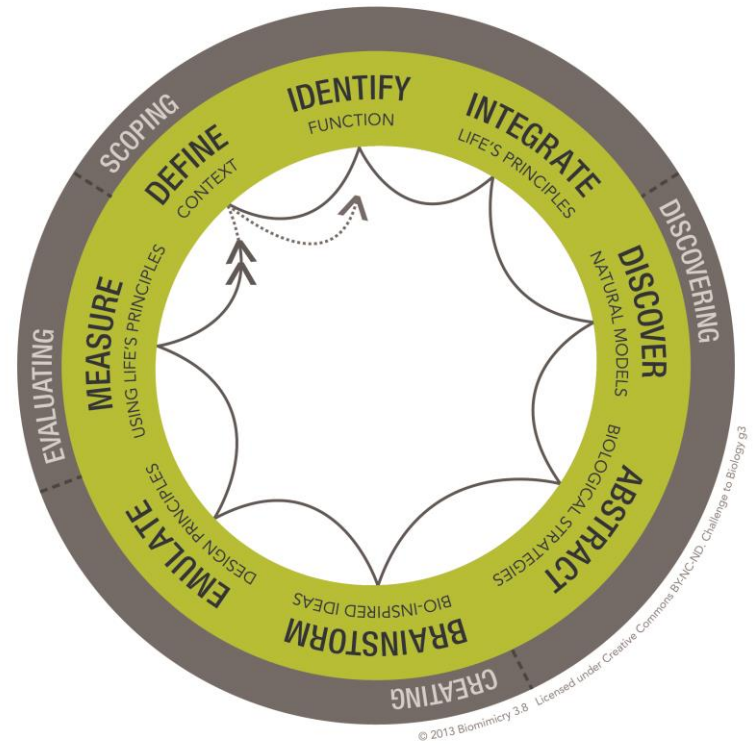
system



## BIOMIMICRY THINKING

Biomimicry DesignLens

BIOLOGY TO DESIGN



## BIOMIMICRY THINKING

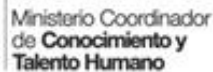
Biomimicry DesignLens

CHALLENGE TO BIOLOGY

All material available as creative commons at <https://biomimicry.net/the-buzz/resources/biomimicry-designlens/>

# Biomimicry Germany

## Network & Partners



Deutschland  
Land der Ideen



Ausgezeichneter Ort 2014/15



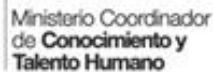
Ausgezeichnet durch den NACHHALTIGKEITSRAT



Ausgezeichnet durch den NACHHALTIGKEITSRAT

# Biomimicry Germany

## Network & Partners



We do not sign non-disclosure agreements on the knowledge mining and source of inspiration following our vision to enable any stakeholder to access this information.

The implementation and the technological details are still however not 100% open access.

# Biomimicry Germany



## Projects

**Audi**   
Urban  
Future  
Initiative



# AUDI Urban Future Award

2014



FALLING WALLS **LAB 2013**

100 finalists | 3 minutes  
Berlin Nov 8 - 9

# AUDI Urban Future Award

The challenge for team Berlin | 2014



*blur the boundaries of private and public mobility*

# AUDI Urban Future Award

The team



urban mobility



**Schindler**

vertical mobility



Biomimicry  
Germany

flow systems in nature

All material (from research to designs) available at

<http://studioschwitalla.org/work/audi-urban-future-award-2014>

<http://audi-urban-future-initiative.com/facts/team-berlin>



# AUDI Urban Future Award

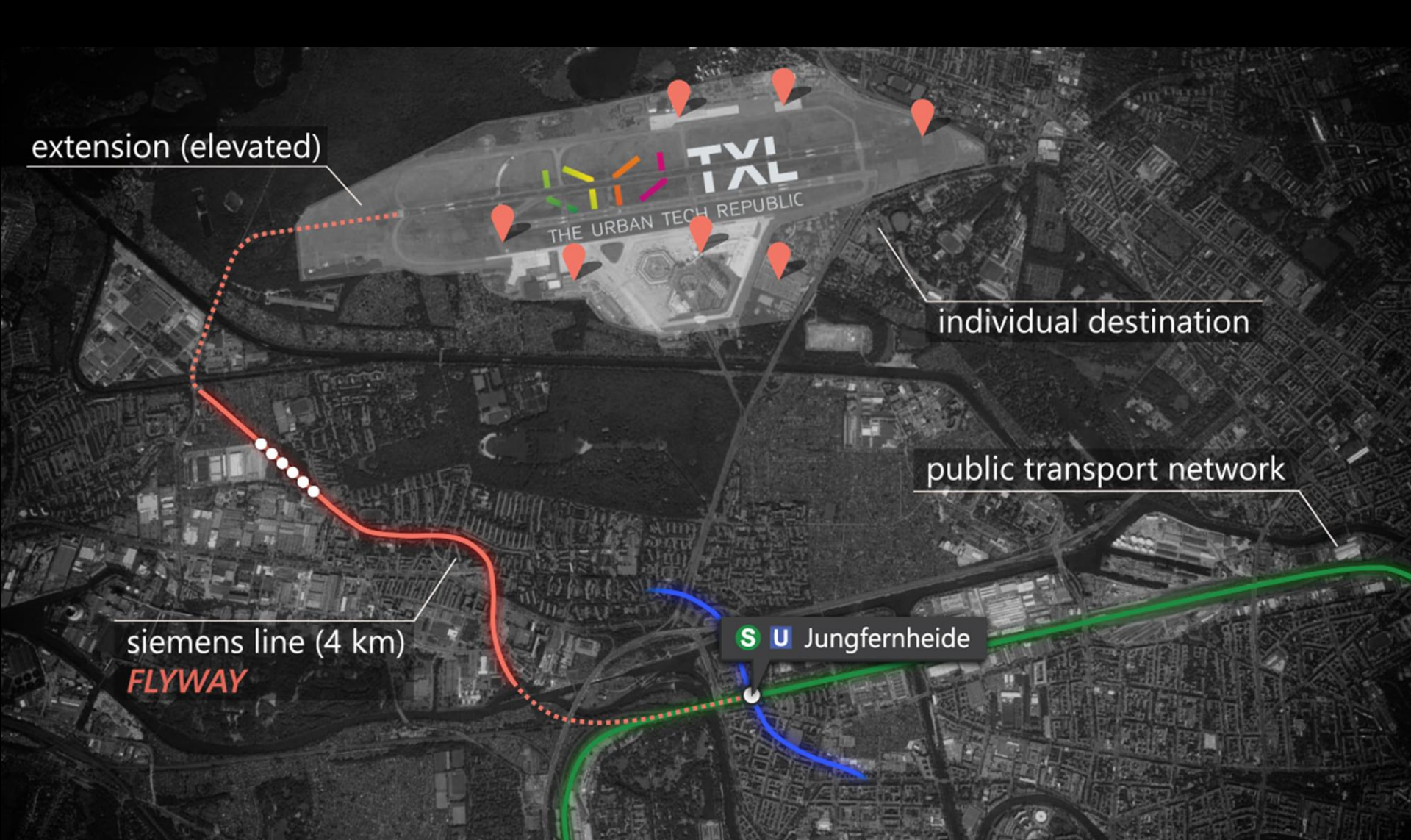
The team

## Audi Insight Team



**Frank Rimli**  
Exterior Designer  
AUDI AG

We are excited about the interdisciplinary make-up of the Berlin team and its enormous specialist knowledge in three different fields. We have looked closely at the interaction of the city and the car, and have transferred experience from vertical to horizontal movement. Our design team was so pleased with this idea that several of my colleagues created their own personal fly-wheel.



extension (elevated)

individual destination

public transport network

siemens line (4 km)

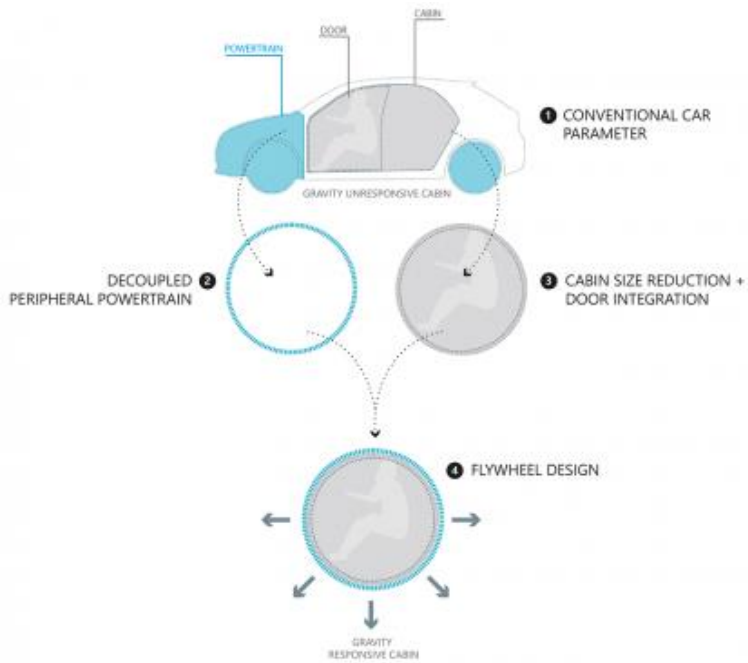
**FLYWAY**

**S U** Jungfernheide

The project „DESTINATION COLLECTIVE“ showcases all aspects of the envisioned future concept including individual destination control, autonomous driving, and collective mobility that can be experienced by the users.

# AUDI Urban Future Award

Inspiration from nature



*How does nature transport materials (to decouple the power train) ?*

*How does nature optimize flow (for automated driving) ?*

*Just-in-time algorithms (to reduce parking times)*

# AUDI Urban Future Award

Advantages of open research (access & usage)

spread  
the word

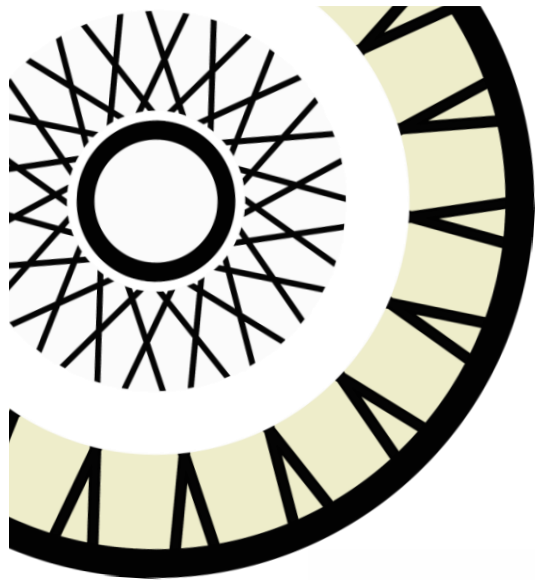


open access  
of info

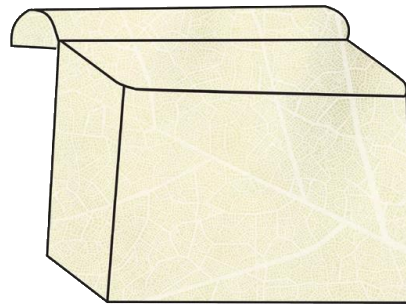
projects

# Biomimicry Germany

Projects – co-supervising with universities



**PARALLEL  
CYCLE**



**CONTAINER**

**BIOLOGICAL CYCLE**

BIO-BASED PLASTIC  
COMPOSTABLE

+



**STRUCTURE**

**TECHNICAL CYCLE**

STRAPS / ZIPPERS / BUTTONS / BUCKLES  
EXTENDS FUNCTIONS

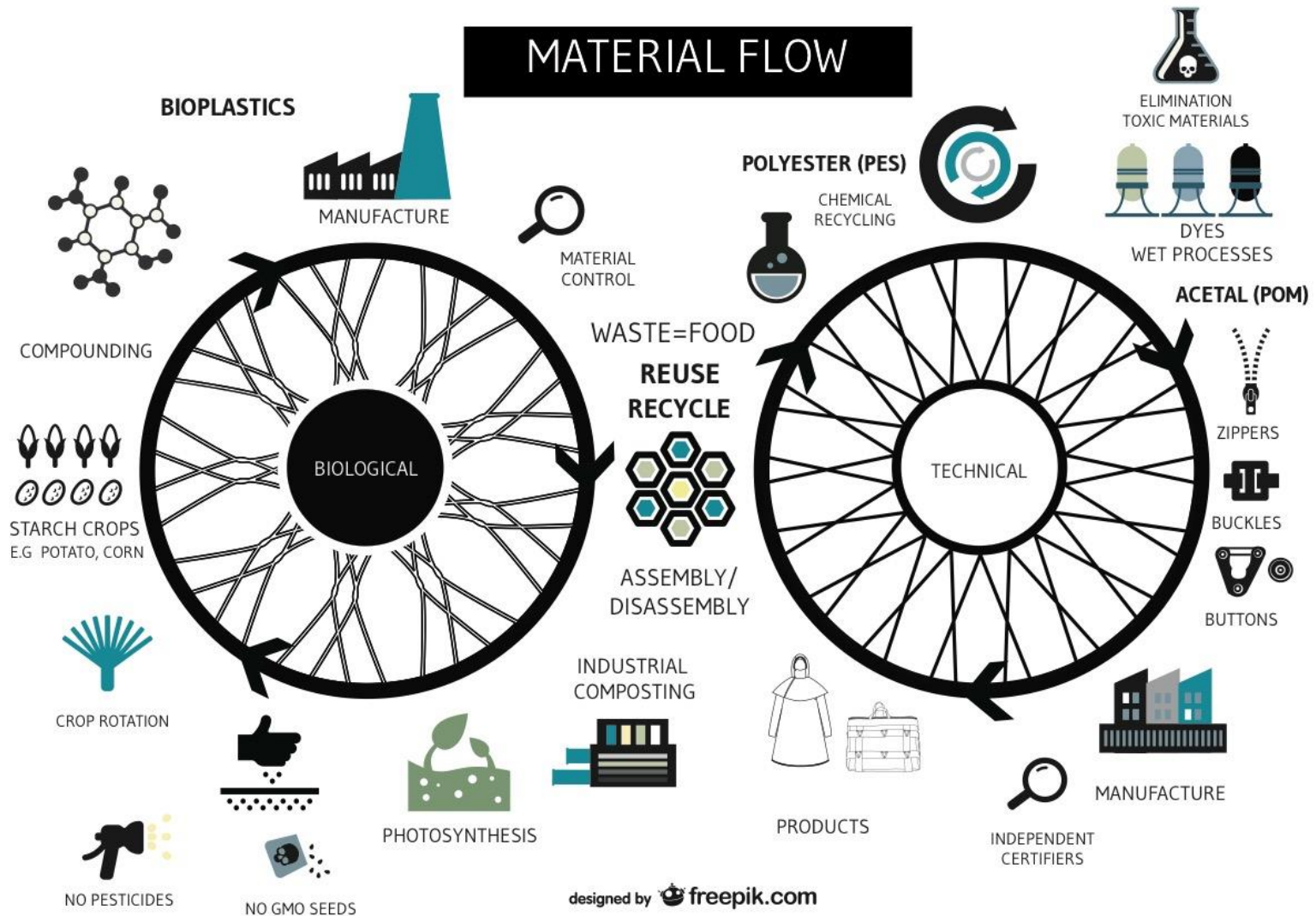
# Biomimicry Germany

Projects – co-supervising with universities



# Biomimicry Germany

Projects – co-supervising with universities



# Biomimicry Germany

Activities

Workshops

museum für  
naturkunde  
berlin





# Biomimicry Germany

## Activities

### Bio-Inspiration Lab (thinktanks)

Creative Commons: CC BY-SA 3.0 | By Richard Wheeler  
(Zephyris) | Own work | Source: bit.ly/2dLTWQO

**BIO-INSPIRATION LAB**  
**bio-materials**

Guest speaker: Julian Lechner,  
founder of Kaffeeform

October 20th | 7pm | Berlin  KAFFEEFORM.

*for a resilient and regenerative society*

**BIOMIMICRY THINK TANK**


Biodiversity | Ecosystems | Emergence

19 March 2014 | 19.15 Betahaus  
(19.00 meet @ BetaCafé)

**Agenda:**

- 19.00 meet & greet @ BetaCafé
- 19.15 Rethink: Emergence  
Biomimicry Germany  
Room: Reception
- 19.30 Dr. Tim Landgraf  
Humboldt Universität Berlin  
Autonomous robots  
Bees: the social network of honeybees  
RoboBee: swarm intelligence in felt schools  
<http://www.robobee.com/en/mediainfo/press/>
- 20.30 mingle & networking

let's get inspired

 biomimicry germany

contact us:  
[contact@biomimicrygermany.de](mailto:contact@biomimicrygermany.de)  
[www.biomimicrygermany.org](http://www.biomimicrygermany.org) | 2014 Quarter 1 - session: Biodiversity



biomimicry think tank

**Rethink: Urban Mobility**  
2+2 = 6 'nature recalculates mobility'

**Audi Urban Future Initiative**  
Studio Schwitalla | Schindler AG | Biomimicry Germany

**August 4th, 2014**  
Leipziger Straße 119, Berlin

19:00 meet & greet  
19:30 introduction & news  
19:45 project presentation: future urban mobility  
20:30 closing remarks & outlook  
20:45 networking with snacks & drinks

Deutschland  
Land der Ideen  
  
Ausgezeichnete Orte 2014/15  


materials, architecture, mobility, ...

# Biomimicry Germany



Activities

Biomimicry Walks & Immersion Workshops  
enhancing the senses

# Biomimicry Germany

## Activities

Das fachübergreifende Symposium für zukünftige Kooperationen

6.-7. November 2016  
in Berlin



**2<sup>nd</sup> nature** 

Nachhaltige Innovation durch Bio-Inspiration

[www.secondnature.berlin](http://www.secondnature.berlin)

# EU Network

GYA  
MEP  
EU

## **Biomimicry Germany**

(Arndt Pechstein, Prateep Beed, Fabian Feutlinske)



## **Biomimicry Iberia (Spain&Portugal)**

(Theresa Millard, Carlos Rego, Diego Soroa)



## **Biomimicry NL**

(Saskia van den Muijsenberg, Danielle Davelaar, Bas Sanders)



## **Biomimicry France (BiomimicryEuropa)**

(Kalina Raskin, Denis Haudebault)



## **Bayonik Cluster**

(Kristina Wanieck)



## **Biomimicry UK**

(Richard James MacCowan, Annette Schumer, Angela Beardsley)



## **Biomimicry CH**

(Jacques Chirazi, Christian Haeuselmann)



## **Biomimicry Ireland**

(Katy Egan)

## **Biomimicry Belgium**

(Stephan Hoornaert, Gauthier Chapelle)

## **Biomimicry Italy**

(Alessandro Biancardi, Alessandro Vija)

## **Biomimicry Turkey**

(Melodi Acar)

## **Biomimicry Czech**

(Lucie Havlova, Helena Pankova)

Thank You !!!

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