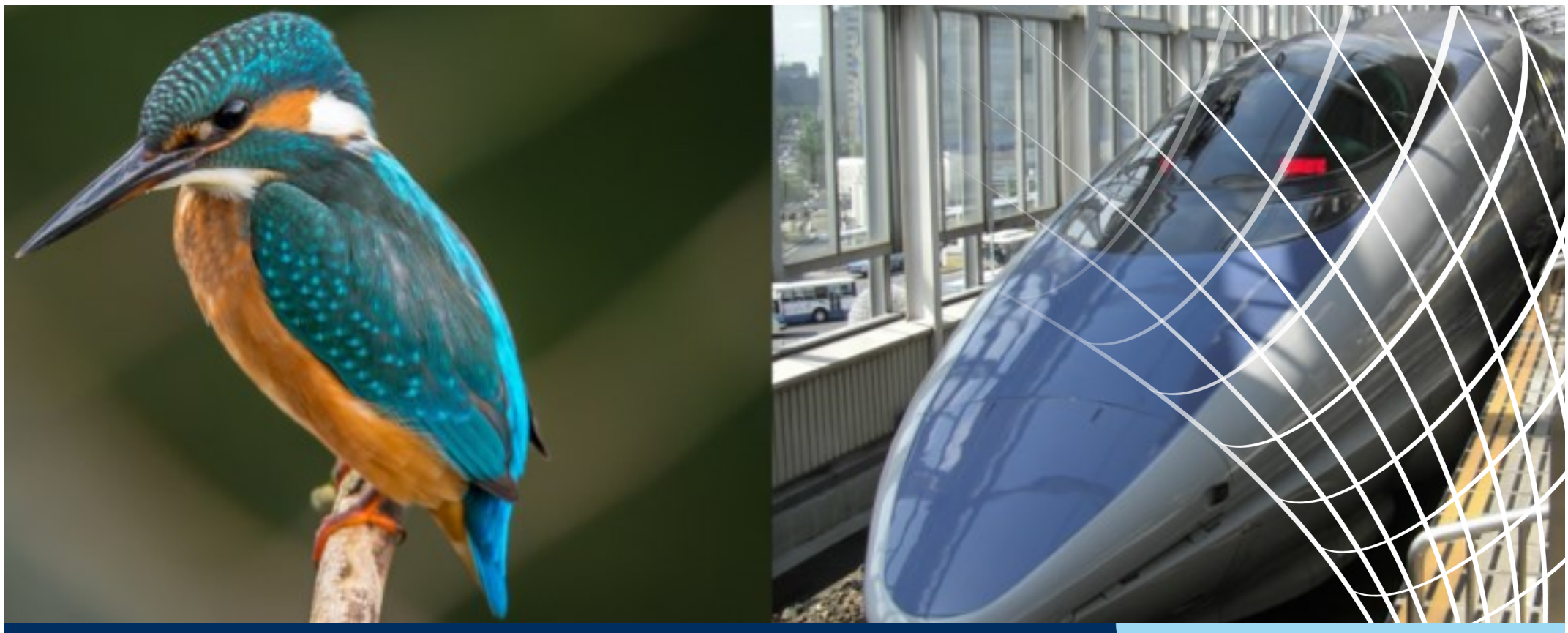
KIVI
Engineering Society



Royal Netherlands Society of Engineers

KIVI Mechanics Symposium

Biomimicry & Mechanics

The 2017 KIVI Mechanics Symposium will be on the topic of advanced Biomimicry & Mechanics. What can industry learn from 3.8 billion years of R&D experience? How do dragonflies survive without being able to clean their wings? Why are there no fish with propeller propulsion? Are we overlooking something? A better look at nature might be beneficial to all of us.

Date
November 24, 2017

Time
15.00 - 18.00 hrs

Location
University of Twente
Horst Building
Room N109
De Horst 2
7522 LW Enschede

Information
www.kivi.nl/mc

Preliminary program:

Codrin Kruijne has a background in information science and entrepreneurship education. After having completed a unique course in the United States, Mr. Kruijne is now a Biomimicry Specialist. In his career, he has contributed to the development of education on biomimicry at Utrecht University, and is now focusing on facilitating application biomimicry in business.

Dr. Martin Bennink is lector NanoBio/Nanotechnology at Saxion University of Applied Sciences, in Enschede. He is chairing a research group that is setting up application-driven, multidisciplinary research projects at the interface of nano-technology and life sciences. These projects are in very close collaboration with industry, SMEs and other societal partners.

Prof. dr. ir. Tom van Terwisga is a teamleader Resistance and Propulsion in the R&D department of MARIN and a visiting professor at Delft University. His expertise is on Propulsion and Two Phase Flows. Spearheads of research in Delft focus on Cavitation Nuisance Prediction and Drag Reduction by Air Lubrication.

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Presentations

Codrin Kruijne

Do you want to know how nature is used to be creative? Do you want to know how nature leads human kind to sustainable innovations? The presentation by Codrin Kruijne seeks to answer these questions by giving an introduction in the field of biomimicry. In 3.8 billion years nature has developed many solutions with respect to all kind of challenges that we are facing in the field of water, food, energy, communication and coordination. Biomimicry aims at studying and learning solutions from nature and using these solutions for the design of products, processes and systems.

Dr. Martin Bennink

Nature has evolved into a multitude of interesting structures that are directly linked to interesting functions on all kind of scales. Nanoscience and nanotechnology are novel fields that attempts to understand, characterize and manufacture structures, materials and devices on a very small scale, typically being between 1 and 100 nm. NanoBioInspiration studies these natural structures in detail to understand them and to reproduce them. Martin Bennink will discuss how we can learn from nature and will give a number of examples of natural structures and their possible reproduction.

Prof. dr. ir. Tom van Terwisga

Why are there so few ships with flapping fin propulsion? And why are there no fish with propeller propulsion? Are we, or even evolution, overlooking something? The presentation by Tom Terwisga seeks to answer these questions by starting with a fundamental discussion on energy losses and efficiency in ship and fish propulsion. Then Terwisga will dive into the details of different forms of fish propulsion, mostly in ships. Finally examples of propeller propulsion on living fish or mammals are shown.

Pictured below: Model test set-up in MARIN's Depressurized Wave Basin (Vermeiden et al. ONR symposium, 2012) . The barge (left picture) is used to carry the fin propulsion system, which is depicted in the right picture where for this case two fins are mounted.