Bioengineering
Principal Investigators

October 2021

TU Delft | Delft Bioengineering Institute
The virtual TU Delft Bioengineering Institute (BEI) strengthens the campus-wide collaboration of scientists who work on engineering solutions in, with and for biology and links them with external partners. In this booklet you can find profiles of BEI Principal Investigators who are looking for collaboration.

Contact

Nienke van Bemmel
Coordinator Delft Bioengineering Institute
E: N.vanBemmel@tudelft.nl
T: +31 (0)6 14 34 97 03
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Ali Akyildiz
Cardiovascular biomechanist looking for microscale imaging physicists, mechanobiologists, and/or cell experimentalists.

Biomechanical Engineering
Cardiovascular Biomechanics Group
a.c.akyildiz@tudelft.nl

About my work
Improved diagnosis and prognosis of diseases, and developing effective preventive strategies and therapies can only be achieved if the healthy tissue mechanics and multifactorial mechanisms involved in the onset and progression of the related pathologies are elucidated. I perform computational and experimental studies to understand healthy and diseased cardiovascular tissues and organs (e.g. vessels, heart) using continuum mechanics approach.

My main research interests
Cardiovascular tissues/organs | Multiscale modelling | Soft tissue failure

I am looking for
Mechanobiologists | Microscale imaging physicists | Cell experimentalists

My expertise and technologies to offer
Soft tissue mechanical experiments | Computational modeling | Clinical & preclinical imaging
Paul Breedveld
Expert on bio-inspired design in minimally-invasive surgery, 3D printing and soft robotics, looking for biologists, designers and material scientists.

Biomechanical Engineering
Bio-inspired Technology (BITE)
P.Breedveld@tudelft.nl

About my work
Collaborating with biologists, medical companies and (academic) medical centres, the research within my research group BITE (Bio-Inspired Technology) has resulted in a great number of innovative medical devices, such as multi-steerable instruments and catheters inspired by anatomy of squid tentacles, high-precision biopsy harvesters inspired by chewing organs of sea-urchins, mechanical follow-the-leader instruments inspired by snakes, self-propelled steerable needles and tissue transporters based on ovipositors of parasitic wasps, and integrated-assembly 3D-printed instruments and prostheses designed for low-cost use in developing countries.

My main research interests
Biomimicry | Soft robotic medical devices | Non-assembly 3D printing

I am looking for
Biologists | Designers | Material scientists

My expertise and technologies to offer
Biomimicry | Medical devices | 3D printing
Dimitra Dodou
Adhesion, soft-tissue grip and experimental methods expert looking for soft polymers, stimuli-responsive polymers, soft matter and soft robotics experts.

Biomechanical Engineering
Medical Instruments & Bio-Inspired Technology
D.Dodou@tudelft.nl

About my work
My research aim is to develop adhesives and adhesive methods that allow for the effective manipulation of soft and wet biological tissue. In other words, my research is concerned with the study of interfacial phenomena between two bodies, where at least one of the two bodies is living, wet, soft, and vulnerable.

My main research interests
Wet adhesion | Secure and gentle grip

I am looking for
Soft polymers | Stimuli-responsive polymers | Soft matter | Soft robotics

My expertise and technologies to offer
Adhesion | Soft-tissue grip | Experimental methods
Frank Gijsen
Cardiovascular Biomechanics expert, looking for experts in failure mechanics, multiscale modelling, uncertainty quantification and in-silico clinical trials.

Biomechanical Engineering
Cardiovascular Biomechanics Lab
f.gijsen@erasmusmc.nl

About my work
I focus on image-based biomechanical modeling of the cardiovascular system. My interests include the influence of blood flow induced wall shear stress on atherosclerotic plaque progression, composition and rupture. I also study plaque biomechanics in order to assess the mechanical stability of plaques. Finally, I recently developed a strong interest in intracranial thrombus mechanics. I combine state of the art finite element analysis of both the blood flow, plaque and thrombus mechanics with the latest clinical imaging modalities and in vitro experimental techniques.

My main research interests
Cardiovascular blood flow mechanics | Atherosclerotic plaque mechanics | Multiscale modelling of thrombus failure

I am looking for
Failure mechanics experts | Multiscale imaging of biological tissues | (Micro)mechanical evaluation of local material properties

My expertise and technologies to offer
Computational Cardiovascular Fluid Mechanics | Experimental methods for mechanical evaluation of soft biological tissues | Clinical imaging of the cardiovascular system
Mohammad J. Mirzaali
Expert in implementing biomimetic approaches using multi-material 3D printing, looking for experts in bioelectronics, and implantable sensors.

Biomechanical Engineering
Biomaterials and Tissue Biomechanics
M.MirzaaliMazandarani-1@tudelft.nl

About my work
My main research interests concern using biomimetics approaches (e.g., functional gradient, hierarchy) in the design and fabrication of bio-inspired, multi-functional, smart materials. That involves understanding, learning, and mimicking the mechanics and characteristics of natural materials in artificial bioengineering materials. In particular, my research focuses on finding the essential features existing in the design of extreme natural hard-soft connections (such as bone-tendon tissue interface) and developing novel methodology to solve challenges in the field of tissue interface engineering.

My main research interests
Computational modeling | Tissue Interface Engineering | Biomimetics

I am looking for
Sensor implementation | Cell mechanobiology | Bioelectronics

My expertise and technologies to offer
Computational modeling | Multi-material 3D printing | Biological tissue characterization
Mathias Peirlinck
Soft tissue biophysics modeling expert looking for biologists, imaging experts and experimentalists interested in soft (cardiovascular) tissue behavior.

Biomechanical Engineering
Cardiovascular Biomechanics Lab
m dot Peirlinck at tudelft dot nl

About my work
My research focuses on the long-life health of the cardiovascular system through improved diagnosis, prognosis and risk assessment. I develop tools to provide an increased understanding of the multiscale behavior of the cardiovascular system, bridging the cell, tissue and organ scale. Using numerical modeling and machine learning techniques, I integrate multifaceted experimental and clinical imaging data into computer models that simulate the (patient-specific) biophysical behavior of the heart and arterial system.

My main research interests
Cardiovascular biomechanics and electrophysiology | Machine learning | Digital twins of soft organs

I am looking for
Experimental mechanical and electrophysiological testing | Multiscale/multimodal/medical imaging experts | Biologists

My expertise and technologies to offer
Soft tissue biomechanics and electrophysiology | Data-driven modeling of soft tissue behavior | Multiscale modeling
Aimée Sakes
Medical Device Design expert looking for zoologists, material scientists, and roboticists.

Biomechanical Engineering
MISIT-BITE
A.Sakes@tudelft.nl

About my work
My research is focused on the development of innovative soft medical devices for minimally invasive surgery. Specifically, I am researching how to design ultra-slender, and untethered, tools that can be used to safely reach deep inside the body to perform surgery. I take inspiration from nature to find solutions to current healthcare challenges and translate these mechanisms into medical devices. Currently, I am exploring integrating tissues into mechanical structures to create biohybrid devices that combine the best of both worlds.

My main research interests
Bio-inspired technology | Soft Robotics | Biohybrids

I am looking for
Zoologists | Material Scientists | Roboticists

My expertise and technologies to offer
Bio-inspired Technology | Medical Device Design | Soft Surgical Robotics
Jie Zhou
Materials scientist looking for experts in cyto-, histo-, and hemocompatibility tests.

Biomechanical Engineering
Biomaterials and Tissue Biomechanics
J.Zhou@tudelft.nl

About my work
I develop biodegradable materials for bone replacement, repair or bone tissue engineering. I am interested in understanding their degradation behaviour, changing mechanical performance and interactions with surrounding tissues and body fluids.

My main research interests
Biodegradable metals and composites | Additive manufacturing

I am looking for
Experts in cyto-, histo- and hemocompatibility tests

My expertise and technologies to offer
Alloy design and fabrication technology | Forming technology | Powder technology
Amir Zadpoor
3D/4D printing, biofabrication and metamaterials expert looking for microbiology, embedded printable electronics and big data.

Biomechanical Engineering
Biomaterials and Tissue Biomechanics
A.A.Zadpoor@tudelft.nl

About my work
We develop biomaterials with impossible properties (meta-biomaterials) through advanced geometrical designs, multi-material 3D/4D printing techniques, and origami/kirigami methods. Biofabrication at different scales, shape-shifting biomaterials, and embedded functionality are at the core of our expertise. From the clinical viewpoint, we focus on the improved treatment of complex skeletal diseases including large bony defects, implant-associated infections, and multi-tissue lesions (e.g. osteochondral defects). Our ambition is to someday be able to print functional living materials and interface them with their non-living counterparts.

My main research interests
Bioprinting | Implant-associated infections | Soft robotics

I am looking for
Microbiology | Embedded printable electronics | Big data

My expertise and technologies to offer
3D/4D printing | Bioprinting | Surface bio-functionalization
Matin Jafarian
Systems & control engineer looking for experts in neuroscience and biology interested in/working on memory, plasticity and learning.

Delft Center for Systems and Control
Hybrid, Adaptive and Nonlinear
M.Jafarian@tudelft.nl

About my work
My research aims at contributing to the mechanistic understanding of human cognition, in particular memory and learning, as well as taking inspiration from the obtained insights to solve engineering problems. I am interested in mathematical models of dynamic neuronal networks underlying cognition, as well as analyzing the local and global behavior of such models.

My main research interests
Memory, plasticity, and learning | Nonlinear, hybrid and stochastic dynamical systems | Complex networks in bio-inspired engineering

I am looking for
Neuroscientists | Biologists | Bio-inspired engineering applications

My expertise and technologies to offer
Modelling and analysis of dynamic networks | Nonlinear, hybrid, oscillating, and stochastic dynamical systems | Coordination and control of dynamic networks
Sergio Pequito
Control system theorist looking for collaborators to solve cool problems at the intersection of dynamical systems and neuroscience/medicine.

Delft Center for Systems and Control
Networked Cyber-Physical Systems
sergio.pequito@tudelft.nl

About my work
My work focuses on developing decision-making mechanisms to unveil dynamical properties of brain activity as well as interact with it to regulate its abnormal behaviour (e.g. epileptic seizures). Additionally, I seek to develop the foundations of how the structure and dynamics of the brain are intertwined, as well as understand the role of external stimuli to its behaviour.

My main research interests
Structural and functional connectivity | Electroencephalographic data | Neurostimulation

I am looking for
Physicians (e.g. neurosurgeons) | Neuroscientists | Neurotechnology developers

My expertise and technologies to offer
Dynamical and control systems theory | Decision making under uncertainty | Quantitative system medicine
Raf van de Plas
Molecular imaging and computational mass spectrometry expert looking for molecular imaging applications and problems in big data imaging analysis and analytical chemistry.

Delft Center for Systems and Control
Numerics for Control and Identification (N4CI)
raf.vandeplas@tudelft.nl

About my work
Our lab focuses on the interface between three different fields: (1) mathematical engineering and machine learning; (2) analytical chemistry and instrumentation physics; and (3) life sciences and medicine. My research is specifically focused on the computational analysis of molecular imaging modalities such as imaging mass spectrometry and microscopy, and on the mathematical integration of information from different imaging technologies through data-driven image fusion.

My main research interests
Signal analysis & machine learning | Molecular imaging | Mass spectrometry

I am looking for
Molecular imaging applications | Big data imaging analysis problems | Computational analytical chemistry problems

My expertise and technologies to offer
Advanced signal analysis and machine learning methods for imaging | Image fusion between different imaging technologies | Imaging mass spectrometry
Carlas Smith
Super-resolution microscopy expert
looking for bio-applications for super-
resolution microscopy, single-molecule
imaging and biophysics.

Delft Center for Systems and Control
Numerics for Control and Identification
c.s.smith@tudelft.nl

About my work
There is an urgent need for high-throughput, high-resolution,
live-tissue imaging to effectively study the origin, progression, and
treatment of human diseases. I take a synergistic approach that
considers optics and information aspects together to maximize
the recorded information content of a microscope. The technology
developments target single-molecule imaging with nanometer-
resolution in live-thick tissue.

My main research interests
Super-resolution | Single molecule kinetics (CoSMoS) | 
Computational imaging

I am looking for
Bio-applications for super-resolution microscopy | Bio-
applications for single-molecule imaging | Bio-applications for
biophysics

My expertise and technologies to offer
Super-resolution microscopy | Single molecule imaging | 
Advanced stochastic signal analysis
Michel Verhaegen
Numerics for Control and Identification
(N4CI) expert looking for large scale network identification and control problems, and high resolution imaging applications with BioData.

Delft Center for Systems and Control
Numerics for Control and Identification
m.verhaegen@tudelft.nl

About my work
I am interested in retrieving mathematical models of dynamical systems from excitation-response measurements retrieved in dedicated system identification experiments. Current interest focuses on the identification of spatial-temporal dynamical systems with a large number of actuators and sensors.

My main research interests
Numerical method development for identification of large scale systems | Sensor array networks and control for high resolution imaging

I am looking for
Large scale network identification and control problems | High resolution imaging applications with BioData

My expertise and technologies to offer
World class research in System Identification and Control
Jovana Jovanova
Bio-inspired design expert looking for marine biologists, soft robotics and 4D printing.

Maritime and Transport Technology
Transport Engineering and Logistics
j.jovanova@tudelft.nl

About my work
My research is focused on the design of multifunctional smart structures and systems. Multifunctional design includes smart materials and active components able to perform multiple functions through controlled combinations of structural property adjustments and dynamic behaviour modifications. Applications vary from compliant mechanisms, deployable and metamaterial structures, to adaptive intelligent systems, soft robotics, origami designs, and vibration control. I want to develop bio-inspired large-scale smart structures that take in consideration different properties of smart materials, embedded sensors, actuators and controllers.

My main research interests
Large scale structures and systems | Design optimization | Metamaterial structures for vibration control

I am looking for
Marine biologists | Soft robotics | 4D printing

My expertise and technologies to offer
Engineering design optimization | Mechatronics | Smart material integration
Sid Kumar
Expert in the intersection of material science, mechanics, and artificial intelligence (AI); looking for collaborations in biomimetics, biomaterials, and biomedical engineering.

Materials Science and Engineering
Mechanics, Materials and Computing Group
Sid.Kumar@tudelft.nl

About my work
My group focuses on merging classical physics-based modeling and new AI techniques for understanding the physics of complex materials and designing new materials with tailored, unusual, and beneficial properties. Some of the current applications that we are working on include inverse-designed and biomimetic scaffolds, constitutive model discovery for soft-tissues, nature-inspired impact absorbing materials, among others. We are a computational modeling, design, and optimization-focused group and keen to explore new and diverse applications.

My main research interests
Materials by design | Computational mechanics | Artificial intelligence

I am looking for
Biomedical engineering | Bio-inspired design | Additive manufacturing

My expertise and technologies to offer
Architected and designer metamaterials | Physics-informed AI for design and optimization | Multiscale modelling
About my work
The target of my research is to develop multi-scale (nano-micro-meso) 3D fabrication paradigms to address open questions in cell biology. I am interested in particular in the design and fabrication of 3D architectures by employing light-assisted additive manufacturing techniques (such as two-photon lithography and stereolithography). I plan to exploit the 3D engineered microenvironments for studying the mechanobiology and differentiation mechanisms of cells coming from different tissues (e.g. brain, bone) as well as the response of cancer cells to proton therapy.

My main research interests
3D Engineered Scaffolds | Neuroscience | Mechanobiology

I am looking for
3D Immunofluorescence Imaging | Cell biologists | Polymer/hydrogel chemists

My expertise and technologies to offer
3D microfabrication | Mechanical Nanoindenting | Scanning electron microscopy
Ivan Buijnsters
Materials & Surfaces Engineer looking for biochemists, water/wastewater engineers and surface chemists.

About my work
The focus of my research is the development of diamond-based functional surfaces and nanomaterials for micro and nano engineering applications. In particular, I work on the synthesis, characterization and application of diamond thin films and nanoparticles for application in (photo)catalysis, electrochemical biosensing, tribology, and water treatment.

My main research interests
Carbon nanomaterials, particularly diamond | Materials synthesis | Surface engineering

I am looking for
Biochemists | Water/wastewater engineers | Surface chemists

My expertise and technologies to offer
Tailored diamond materials (e.g. thin-film electrodes, nanoparticles) | Thin film deposition | Materials characterization
Sabina Caneva
Nanotechnology, 2D materials and nanopore expert looking for synthetic biology, biochemistry and single molecule imaging.

**About my work**
I am interested in creating nanoelectromechanical devices to study the function of mechanically-activated biological and artificial nanopores in vitro. My research combines nanofabrication, microfluidics, single-molecule conductance and fluorescence measurements. I currently work on the following research lines: (i) developing acoustic tweezers to spatially and temporally manipulate individual biomolecules in lipid bilayers using sound waves and (ii) designing and controlling dynamic DNA nanostructures.

**My main research interests**
Protein, DNA and solid state nanopores | Single molecule manipulation techniques (acoustic and optical tweezers) | Stimuli-responsive bionanostructures

**I am looking for**
Synthetic biology, biochemistry (liposomes, artificial lipid bilayers) | DNA origami nanotechnology | Super-resolution imaging

**My expertise and technologies to offer**
Nanopores | 2D materials | Micro/nanofabrication & microfluidics
Murali Ghatkesar
Micro-Nano Engineer looking for single cell biologists, biophysicists and biochemists.

About my work
I am interested in developing micro and nanoscale devices for quantification in biology and chemistry. I use a range of micro and nano fabrication techniques to make these devices. Some of my activities are: pipetting femto-liter volumes of fluid from individual cells, weighing mass of single cell objects and measuring elastic properties of soft objects.

My main research interests
Micro and Nano fabrication | Micro and nano fluidics | Biophysics

I am looking for
Single cell biologists | Biophysicists | Biochemists

My expertise and technologies to offer
Micro and nano fabrication | Single cell biopsy | Atomic force microscopy
Andres Hunt
Expert in ‘smart’ material sensors and actuators looking for specialists in (cell) biology, biotechnology, materials science and more.

About my work
I investigate ‘smart’ material sensors and actuators. These are material level transducers that couple the electrical and mechanical energy domains. My research addresses their manufacturing, improving their performance, and their utilisation in applications. Current and potential application studies include microfluidics, soft robotics, metamaterials, and (spatially) distributed sensing and actuation. I am looking for open problems and collaborations to improve the materials and to create innovative and high-impact applications.

My main research interests
Smart material sensors and actuators | Manufacturing and prototyping | Metamaterials

I am looking for
Biology and medical specialists | Materials scientists | Open problems and design collaborations

My expertise and technologies to offer
Smart material sensors and actuators | Manufacturing | Soft robotics
Hassan HosseinNia
Advanced motion control, soft actuator and distributed actuator expert looking for precision robotics and abdominal assist device.

About my work
I am interested in developing precision motion systems for high-tech as well as medical applications. My current research is twofold: 1) in development of industry standard, easy to use motion controller applying nonlinear strategies and 2) in development of integrated active metamaterial (soft actuator) for vibration damping in precision systems and for actuation in medical application.

My main research interests
Precision robotics | Precision positioning systems | Precision control

I am looking for
Precision robotics | Abdominal assist device

My expertise and technologies to offer
Advanced motion control | Vibration control | Smart material actuator
Sophinese Iskander-Rizk
Photoacoustic imaging & systems engineering expert looking for tissue/cell engineers, integrated sensor technology, physicists and computer scientists.

About my work
My research is about developing imaging solutions for medical problems and advancing medical technology solutions. I have worked on spectroscopic and intravascular/intracardiac photoacoustic imaging of atherosclerosis, radiofrequency ablation for atrial fibrillation and flow, and on super-localization photoacoustic imaging of optically contrasting objects. I research fundamental science/physics of wave and light-tissue interaction phenomena to develop better models and thus engineer better treatment, diagnostic and management tools for the medical field.

My main research interests
Minimally invasive instruments | Cardiac arrhythmia surgical guidance and monitoring (imaging) | Microscopic and macroscopic multimodal medical imaging

I am looking for
Tissue/cell electrical activity | Pressure sensor (high bandwidth, high sensitivity) | Computer science/ artificial intelligence

My expertise and technologies to offer
Photoacoustic & ultrasound imaging systems
Photoacoustic & ultrasound catheter design
Urs Staufer
Expert in microfabrication, scientific instrumentation and nanotechnology, looking for cell biologists, polymer scientists, and surface functionalisation.

Precision and Microsystems Engineering
Micro and Nano Engineering
U.Staufer@tudelft.nl

About my work
I design and fabricate instruments and elements of instruments for scientific research in the bio/health field. This involves individual sensors, entire systems like organ-on-chip devices or instruments for in- or ex-vivo measurements. I develop the processes needed for building these instruments.

My main research interests
Micro and Nano Fabrication | Organ-on-Chip

I am looking for
Cell biologists | Polymer scientists | Surface functionalisation

My expertise and technologies to offer
3D Micro and Nano fabrication | Atomic Force Microscopy
Gerard Verbiest
Expert in ultrasound, 2D materials and Atomic Force Microscopy looking for nanoscale bio-applications.

Precision and Microsystems Engineering
Dynamics of Micro- and Nanosystems
G.J.Verbiest@tudelft.nl

About my work
My aim is (1) to develop revolutionary ultrasound technology to study the subsurface structure of samples with an atomic force microscope and (2) to investigate ultrasound waves in 2D materials for unraveling their heat and sound transport. The goal of these developments is to provide key technologies for the future of electronics, material science and cell biology.

My main research interests
Nano acoustics | 2D materials | Atomic Force Microscopy

I am looking for
Microbiologists | Nanofabrication | Surface chemists

My expertise and technologies to offer
Ultrasound | Atomic Force Microscopy | 2D materials
**About my work**
I develop novel membranes for different separation applications ranging from wastewater treatment to gas separation. Specifically, I'm interested in understanding the fundamental governing mechanisms as well as the interactions between different species and the membrane material. I focus on investigating potential applications of new bio-based polymers/materials for advanced membrane separations such as stimuli-responsive membranes. Actuation/sensing applications of such materials as well as the biomedical applications (e.g. drug delivery) are also of interest.

**My main research interests**
Membrane separations | Bio-based polymers | Stimuli-responsive materials

**I am looking for**
Biomedical engineers | Bio/polymer chemists | Microbiologists

**My expertise and technologies to offer**
Interface science and wetting properties | Membrane separations | Microfluidics
Burak Eral
Soft matter, crystals and microfluidics
guy looking for human cell line
culturing know-how, biomineralization
and gut bacteria.

About my work
I focus on understanding the fundamental out-of-equilibrium manufacturing/separation processes involving flow, phase transitions (particularly crystallization) and soft matter/complex fluids. Our approach is to understand how structure/dynamics of soft matter (hydrogels, emulsions, surfactants) and flow can be leveraged to dictate molecular phenomenon (polymorphism, crystallization, phase separation) and, ultimately, harness this understanding to rationally design functional materials and processes.

My main research interests
Soft matter | Crystallization | Hydrodynamics

I am looking for
Human cell line culturing know-how | Biomineralization |
Gut bacteria

My expertise and technologies to offer
Crystallization | Microfluidics | Soft matter
Wiebren de Jong
Thermochemical biomass conversion, biorefinery and energy storage systems expert looking for process system integration, biorefinery and energy storage.

About my work
I develop processes for the conversion of biomass/waste possibly integrated with energy storage via electrolysis (CO₂, water). In the group we perform process system design modelling work as well as experimental development and testing of key components in integrated systems.

My main research interests
Energy storage concepts | Biorefinery | CO₂ capture and utilization

I am looking for
Process system integration | Biorefinery | Energy storage

My expertise and technologies to offer
Process system design and modelling | Bioresources characterization | Fuel conversion testing
About my work
Our group works on electrocatalytic processes where we can convert small molecules, such as CO$_2$, N$_2$ and water, into fuels and chemical building blocks with the use of electricity. Specifically, we are interest in obtaining molecular understanding how these electrocatalytic reactions proceed, developing new electrocatalytic materials and processes and building prototype electrochemical devices that can showcase the developed technology.

My main research interests
Electrochemistry | Electrocatalysis | Material science

I am looking for
Material scientists | Biochemists | Surface chemists

My expertise and technologies to offer
Electrochemistry | Electroanalytic chemistry | Spectroelectrochemistry (FT-IR and Raman)
Daniel Tam
(Bio-)fluid dynamicist looking for algae-based bio-process technology, microfabrication for microfluidics (electro-osmosis) and cell biology.

About my work
Our group investigates the dynamics of active biological fluids involving self-propelled particles. We want to elucidate the origins of the collective behavior observed in many of these dense suspensions (from micro-algae to fish), with the goal of controlling and harnessing this self-generated motion. We use tools from experimental fluid dynamics to track and characterize the dynamics.

My main research interests
Biological Fluid mechanics | Wet-Soft-Complex-Active matter (!) | Microfluidics

I am looking for
Algae-based bio-process technology | Microfabrication for microfluidics (electro-osmosis) | Cell biology

My expertise and technologies to offer
Optical flow diagnostic | 3D-optical tracking of microparticles | Fluid mechanics
Brian Tighe
Soft matter physicist seeking experts in rheology/mechanics of biological matter.

Process and Energy
Engineering Thermodynamics
B.P.Tighe@tudelft.nl

About my work
I aim to understand the mechanics of soft solids, thick fluids, and phase transitions between the two. My research combines theory and simulations to develop models that can predict deformation and flow in foams, emulsions, fibrous networks, and other complex fluids with practical applications.

My main research interests
Amorphous solids | Complex fluids

I am looking for
Rheologists | Theorists who can translate biological problems to stat phys/soft matter

My expertise and technologies to offer
Modeling of soft solids and complex fluids
About my work
My research focuses on assessing the impacts of environmental (biological, chemical, thermal, hydraulic) loads on the behaviour of geomaterials and on the performance and resilience of geotechnical structures. I aim to develop new fundamental understanding of multi-physical processes in geomaterials using state-of-the-art imaging, experimental testing and numerical modelling techniques.

My main research interests
Bio-cementation of soils | Self-healing materials | Discrete element modelling

I am looking for
Environmental microbiology | Microfluidics | Imaging techniques

My expertise and technologies to offer
Mechanical testing of geomaterials | Numerical modelling of multi-physics processes
Julia Gebert
Soil microbiologist looking for microbiology, population analysis (DNA/RNA profiling) and water chemistry.

About my work
I investigate sediment organic matter and the role of biological organic matter degradation for sediment rheology, contributing to an new definition of the nautical depth and to an improved management of sediments in ports and waterways. Further, I focus on the beneficial use of dredged material as construction material, e.g. in dikes, to achieve circular economy goals. A newly granted project will research methods to stabilise landfilled wastes to reduce future liability for society and create a sustainable environmentally safe situation.

My main research interests
Greenhouse gas release from riverine sediments | Beneficial use of dredged material | Stabilisation of wastes

I am looking for
Microbiology | Population analysis (DNA/RNA profiling) | Water chemistry

My expertise and technologies to offer
Microbial carbon turnover | Microbial methane oxidation | Biogeochemical soil ripening processes
**Henk Jonkers**  
Bio-adapted building materials expert, looking for bio-polymer experts.

**Materials, Mechanics, Management & Design (3MD)**  
Materials & Environment  
h.m.jonkers@tudelft.nl

### About my work
I develop bio-adapted building materials such as bacteria-based self-healing concrete and bio-receptive concrete. In self-healing concrete specific gram positive non-pathogenic spore forming bacteria together with growth stimulating nutrients are embedded in the concrete matrix in form of a granular ‘self-healing agent’. By activation of crack-ingress water spores germinate and active vegetative cells start to precipitate limestone resulting in sealing of cracks. Bio-receptive concrete allows spontaneous and abundant growth of algae, lichens and mosses on its surface improving its environmental performance.

### My main research interests
Microbial ecology | Material science | Environmental engineering

### I am looking for
Bio-polymer science | Encapsulation | Material bio-receptivity

### My expertise and technologies to offer
Microbial ecology | Material science | Environmental Electron microscopy
Boris van Breukelen
Nature-based subsurface water treatment expert looking for microbiologists.

About my work
We perform research to the innovative and sustainable use of the subsurface environment and specifically to climate adaptation technologies that store and abstract water and (geo)thermal energy. Our focus is on water quality treatment (e.g. nutrients, metals, organic micro-pollutants, and pathogens) in aquifers and sand filters. To this end, we combine field research to pilots, field and lab experiments, and coupled physical-chemical-microbiological modelling.

My main research interests
Reactive (biogeochemical) transport modelling | Field research to nature-based solutions for water storage and treatment | Integrating (ground)water flow, biogeochemistry, and microbial ecology

I am looking for
Microbial ecologists | Molecular microbiologists | Biofilm and genome-scale metabolic modellers

My expertise and technologies to offer
Reactive (biogeochemical) transport modelling | Field demos/pilots on subsurface water and thermal energy storage/abstraction | Environmental water quality monitoring and modelling
Doris van Halem
Drinking water treatment expert looking for engineering microbial communities, antibiotic resistance in water treatment and biofilm characterization.

Water Management
Sanitary Engineering
D.vanHalem@tudelft.nl

About my work
We focus on drinking water treatment for global development, with an emphasis in filtration systems for groundwater and household water treatment. Specific examples of research projects are subsurface arsenic removal, biological As (III) oxidation in rapid sand filters, virus removal with low-cost ceramic membranes and safe reuse of water in urban areas.

My main research interests
Removal of geogenic contaminants (arsenic, fluoride, manganese) | Clever drinking water solutions for global development

I am looking for
Engineering microbial communities in low nutrient and fast-flowing systems | Antibiotic resistance (genes, bacteria) in water treatment | Biofilm characterisation methods

My expertise and technologies to offer
Arsenic and iron removal (linking bio to chemical-physical) | Household water treatment for disinfection | Field research in developing countries
Merle de Kreuk
Wastewater treatment expert looking for enzymes (activity), microbiology (bio-informatics) and computational fluid dynamics (CFD).

Water Management
Sanitary Engineering
m.k.dekreuk@tudelft.nl

About my work
I am Professor of Environmental Technology at the CITG department of water management. I focus on granular sludge processes (aerobic and anaerobic) and (pre)hydrolysis in these systems as well as in anaerobic digestion. Enzymatic (hydrolytic) activity, mixing processes and effect of recalcitrant and inhibiting compounds in these systems are focus points.

My main research interests
Hydrolysis of complex substrates | Granule formation | Formation of products from wastewater

I am looking for
Enzymes (activity) | Microbiology (bio-informatics) | Computational Fluid Dynamics (CFD)

My expertise and technologies to offer
Anaerobic digestion processes | Granular sludge for sewage treatment | Process design
Jules van Lier
(Waste)water treatment expert looking for microbial functionality in complex systems.

Water Management
Sanitary Engineering
j.b.vanlier@tudelft.nl

About my work
My research projects focus on closing water cycles in industries and sewage water recovery for industrial or agricultural reuse. I am specialized in Anaerobic Treatment Technology and I received both my MSc and PhD from Wageningen University. I am full professor “Wastewater Treatment/Environmental Engineering” at the section Sanitary Engineering of CiTG, with a 0,2 fte seconded position at UN-IHE, Delft.

My main research interests
Bio-technologies for (waste)water treatment, from both municipal and industrial origin | Anaerobic treatment (conversion processes) for wastewater, sludges and slurries | Sludge bed systems, (anaerobic) MBR systems

I am looking for
Microbial functionality in complex systems

My expertise and technologies to offer
Mixed microbial processes for environmental engineering | Anaerobic conversion processes (microbiology, technology) | (Waste)water treatment in general
Ralph Lindeboom
Biogeotechnologist looking for thermochemical biomass processing, optics experts and environmental microbiologists.

About my work
Both Space and the deep sea offer interesting opportunities for exploring the boundaries of life. Particularly microbial life in hydrothermal vents provides me with the inspiration to develop novel bio-thermochemical resource recovery concepts from (waste-) water. By frugalizing advanced technological solutions in the bioprocess and thermochemical domains, and isolating specialized microbes from extreme environments, I aim to add value to residual streams in the developing world.

My main research interests
Decentralized resource recovery concepts | High pressure anaerobic digestion | Solar thermochemistry | Frugal engineering

I am looking for
Thermochemical biomass processing | Optics experts | Environmental microbiologists

My expertise and technologies to offer
High pressure biotechnology | Closed Loop Life Support Engineering | Wastewater treatment | Biogeochemistry
Marie-Claire ten Veldhuis
Hydrometeorologist looking for in-vivo imaging, microfluidics and in-vivo measurement of water potential and pressure dynamics.

Water Management
Water Resources Group
j.a.e.tenveldhuis@tudelft.nl

About my work
My work focuses on using observational datasets to analyze and predict how hydrological systems respond to (extreme) rainfall and drought. Recently, I have become interested in studying hydrology at the nano-scale, looking into water transport in lichens, a fungus-algae symbiosis. I am interested in understanding how water transport is regulated by lichen architecture and more generally in plants to quantitatively model water transport in relation to photochemistry (water oxidation).

My main research interests
Hydrometeorology | Smart sensing | Citizen science

I am looking for
In-vivo imaging | Microfluidics | In-vivo measurement of water potential/pressure dynamics

My expertise and technologies to offer
Hydrology | Rainfall variability | Water systems engineering
Johan Dubbeldam
Complex network expert looking for (systems) biology, gene regulatory networks, and applications of adaptive networks in general.

About my work
My work focuses on complex networks and dynamical systems. Specifically, I am interested in the properties and dynamics of networks, which includes epidemics on networks, ecological networks and, most recently, gene regulatory networks. I develop simple network models to investigate how network topology and dynamics on the network correlate. This touches on concepts like robustness and resilience of networks. I am also interested in how game theory can be combined with network dynamics to predict the evolution of a system.

My main research interests
Complex (adaptive) networks | Regulatory networks | Critical dynamical systems

I am looking for
Biologists | Expertise on gene networks | Application of evolutionary game theory

My expertise and technologies to offer
Constructing mathematical models | Investigating stability of network models | Applying evolutionary game theory to network models
Lisanne Rens
Mathematical biologist looking for experimental biologists in cell biology and development, and biophysicists.

About my work
I develop computational models for single cell migration and collective cell migration. I am interested in the interactions with cells and the extracellular matrix. In particular, I study the role of forces (cell traction forces, cell-cell adhesion, extracellular matrix mechanics) on (collective) cell behavior. I also use models of GTPase signaling within the cell and study its effect on migration. I am interested in all kinds of applications, such as blood-vessel formation, embryogenesis, wound healing, cancer metastasis.

My main research interests
Cell migration | Collective cell behavior | Mechanobiology

I am looking for
Cell biology | Biophysics | Development

My expertise and technologies to offer
Cell-based modeling | Computational biophysics | Systems biology
Jochen Cremer
Expert in modifying machine learning methods for energy systems operations, looking for microbiologists, systems biologists and experimental designers.

About my work
I develop AI-based algorithms that can monitor and control physical systems, mainly focusing on energy systems. In energy systems, the challenge is the high-dimensionality and computational complexity of physical phenomena rendering many conventional approaches from control theory unsuitable for the operation of such systems. I focus on those challenges and derive novel Machine Learning methods that enrich control theory with data to train surrogates from both, the system theory, and studied data.

My main research interests
Systems biology | Energy systems | Supervised learning

I am looking for
Microbiologists | System biologists | Experimental designers

My expertise and technologies to offer
End-to-end analysis of simulations and experiments | System theory | Physics-informed machine learning | Theoretical modelling and analysis of systems
Thomas Abeel
Microbial genomics and bioinformatics expert looking for metagenomics and microbial genomics projects.

About my work
I am interested in developing algorithms and visualizations to answer questions in (micro-)biology. Particularly, I am interested to accurately reconstruct the complex heterogeneous genome and transcriptome architectures found in microbial organisms in the medical and industrial domain. The goal is to link genotypes to observed changes in molecular and extended phenotypes of medical or industrial importance, such as antibiotic resistance, virulence or product yield.

My main research interests
Microbial genomics | DNA sequence analysis algorithms | Genomics visualization

I am looking for
Metagenomics and microbial genomics projects involving DNA, RNA sequencing and other -omics datatypes for integration.

My expertise and technologies to offer
High performance computing: ~1000 CPU cluster + supporting infrastructure | Bioinformatics for DNA/RNA sequence analysis | Oxford Nanopore Technologies sequencing: long-read sequencing
Jasmijn Baaijens
Bioinformatics expert looking for open problems in microbial genomics and wastewater sequencing.

**Intelligent Systems**
Pattern Recognition and Bioinformatics
J.A.Baaijens@tudelft.nl

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**About my work**
I am a mathematician turned bioinformatician working on genome reconstruction and analysis for viruses, bacteria and yeasts. More specifically, I develop algorithms and software for reconstruction of microbial genomes from sequencing data, and apply these methods to characterize pathogen diversity in patient or community samples. For example, we can use such algorithms to track mutations or subpopulations over time using wastewater sequencing. Also interested in phylogenetics and outbreak reconstruction.

**My main research interests**
Sequencing data analysis | Wastewater-based epidemiology | Microbial evolution

**I am looking for**
Microbiologists | Genome sequencing | Epidemiologists

**My expertise and technologies to offer**
Sequencing data analysis | Algorithm development | Microbial genomics
Joana Gonçalves
Computational biologist looking for single cell time series, gene editing and molecular perturbation data.

Intelligent Systems
Pattern Recognition and Bioinformatics
joana.goncalves@tudelft.nl

About my work
I develop algorithms for pattern discovery in large-scale molecular biology data. Specifically, I am interested in understanding gene regulation dynamics and disruptions involved in disease to discover new therapeutic targets. I focus on pathway effects by integrating genetic variants (DNA), gene expression (RNA) and regulatory landscape including TF binding, epigenetic marks (ChIP) and chromatin organization (Hi-C). Also interested in perturbation data (CRISPR, si/shRNA).

My main research interests
Gene regulation | Time series | Cancer

I am looking for
Single-cell time series | Gene editing | Molecular perturbation data

My expertise and technologies to offer
Data analysis | Pattern recognition | Machine learning
Marcel Reinders
Bioinformatics, computational biology and machine learning expert looking for single cell biology, long-read sequencing-based biology and molecular neuroscience.

Intelligent Systems
Pattern Recognition and Bioinformatics
M.J.T.Reinders@tudelft.nl

About my work
I initiated work on molecular classification and genetic network modelling. Nowadays, I focus on sequencing analysis tools, network-based analysis, and integration of genomic data. I have ample experience with finding gene signatures, for example with applications in cancer and neurodegenerative data.

My main research interests
Relationship (large) structural variations and disease | Heterogeneity and its development/expansion of cell systems such as the immune system, brain cells or cancerous tissue | Solutions on how to integrate multiple molecular types as well as spatial and temporal data to unravel biological complexity

I am looking for
Single cell biology | Long-read sequencing-based biology | Molecular neuroscience

My expertise and technologies to offer
Tailored development of novel algorithms to analyse big and/or complex molecular data | Broad statistical and machine learning knowledge | High-performance computing infrastructure and solutions
Tiago Costa
Microelectronics expert looking for functional imaging experts, neuroscientists and material scientists.

About my work
I develop micrometre and millimetre scale integrated circuit chips with monolithically integrated transducers for minimally invasive neuromodulation. Specifically, I am exploring miniaturized focused ultrasound devices for high spatial resolution neuromodulation of the nervous system, either non-invasively (peripheral nerves) or minimally invasively (brain). I am also interested in magnetic neuronal interfaces, and on augmenting integrated circuits chips with novel materials for biomedical applications.

My main research interests
Integrated circuits and sensors/actuators | Ultrasound neuromodulation | Magnetic neuronal stimulation and recording

I am looking for
Functional imaging experts | Neuroscientists | Material scientists

My expertise and technologies to offer
Integrated circuits | Miniaturized smart transducers | Ultrasound neuromodulation
About my work
I develop signal processing and machine learning solutions for biomedical problems, to unravel healthy and pathological physiology. More specifically, I discover hidden patterns in multichannel and/or multimodal datasets using both supervised (e.g. classification) and unsupervised (e.g. blind source separation) techniques. In order to tackle high-dimensional and higher order (3D+) data, I often use tensor-based techniques. I have many years of experience in epilepsy research using EEG, fMRI and wearable monitoring. I am also interested in ECG and (functional) ultrasound applications.

My main research interests
Biomedical signal processing | Brain connectivity | Clinical decision support

I am looking for
Bioelectrical sensors | (Neuro)imaging | Personalized medicine

My expertise and technologies to offer
Signal processing, in particular multi-channel | (Tensor-based) blind source separation | Pattern recognition
Massimo Mastrangeli
Micro/nano scientist looking for cell biologists, polymer chemists and plasmonics and optical metamaterials.

About my work
I am going to develop microfabricated fluidic devices for cell cultures based on silicon and polymers and integrating sensors and actuators to realistically recapitulate the microphysiology of human tissues and organs – we call them microphysiological systems, or organs-on-chip. I am also interested in colloid-based bottom-up assembly of nanodevices, self-organization at all scales and soft microrobotics.

My main research interests
Microphysiological systems (MPSs) | Bottom-up assembly of nanodevices | Fluidic self-assembly

I am looking for
Cell biologists | Polymer chemists | Plasmonics and optical metamaterials

My expertise and technologies to offer
Surface tension effects | Self-assembly | Micro/nanofabrication & Microrobotics
Dante Muratore
Microelectronics and brain-machine interfaces expert looking for neuroscientists and material scientists.

Microelectronics
Bioelectronics
d.g.muratore@tudelft.nl

About my work
I design integrated circuits and systems for biomedical applications. Specifically, I am interested in making smarter implantable devices by bringing processing power closer to the sensor with the goal of improving the overall system efficiency and capabilities. I focus on mixed-signal application-specific integrated circuits (ASICs) for bidirectional, single-cell resolution brain-machine interfaces. I am also interested in edge machine-learning circuits for biomedical applications.

My main research interests
Integrated circuits and systems | Brain-machine interfaces | Hardware-algorithm co-design

I am looking for
Neuroscientists | Microfabrication of electrodes | Biosensors

My expertise and technologies to offer
Integrated circuits | Low power electronics | Neural signal acquisition
Sepideh Ghodrat
Materials expert investigating soft, smart and stimuli-responsive materials for bioengineering and well-being applications.

**About my work**
I develop and design shape morphing objects with shape memory materials. Shape memory materials are a specific category of smart materials which give free rein to designers’ creativity to make interactive objects which have a dynamic relation with users. Shape morphing objects can be used in many domains such as healthcare, biomechanics, robotics or personalized products. A number of good practices have been made such as deployable structures, self-sizeable adaptable shoes, self-sizeable grips, self-regulating jackets and soft mobile devices.

**My main research interests**
Smart, novel, stimuli-responsive materials | Soft and smart actuators | Shape morphing objects

**I am looking for**
Biomaterials | Materials testing | Advanced Materials Manufacturing (Additive Manufacturing)

**My expertise and technologies to offer**
Shape memory materials (alloys, polymers, composites) | Mechanics of materials, testing, characterization techniques | Manufacturing, 3D printing
Elvin Karana
Materials and design researcher looking for novel bio-based materials, waste-based materials and materials scientists who are interested in design collaborations.

About my work
My research aims to understand and enhance the relationships people have with the materials of products. I have undertaken this topic with a holistic approach, capitalizing on not only the technical properties of materials, but also meanings, emotions and actions materials in products elicit.

My main research interests
Material Driven Design | Appreciation of Materials | BioBased Materials

I am looking for
Novel bio-based materials | Waste-based materials | Materials scientists who are interested in design collaborations

My expertise and technologies to offer
Experiential characterization of materials | Bridging technical and experiential qualities | Transition of materials into consumer products
Alexis Bohlin
Coherent Raman imaging expert looking for in-situ thermometry applications, microbial production of biofuels and microfluidics.

Aerodynamics, Wind Energy & Propulsion
Flight Performance and Propulsion
g.a.bohlin@tudelft.nl

About my work
Advances in optical imaging techniques over the past decades have revolutionized our ability to study living systems at the microscopic level. Emerging technology for unravelling chemical composition in systems of cellular and molecular biology provides a major asset in research and industrial applications. We develop new frontiers in optical coherent Raman imaging tailored at biofuel production- and renewable aero propulsion systems.

My main research interests
Renewable fuels for air transportation | Reduced emission of pollutants | Ultrafast laser diagnostics

I am looking for
In-situ thermometry applications | Microbial production of biofuels | Microfluidics

My expertise and technologies to offer
Coherent Raman imaging | Time-resolved spectroscopy | Chemical detection and sensing
Santiago Garcia  
Materials scientist looking for biotechnologists to team up with.

Aerospace Structures and Materials  
Novel Aerospace Materials  
s.j.garciaespallargas@tudelft.nl

About my work
My team focuses on understanding how dynamic polymers and biobased substances can be used to develop novel polymeric and hybrid materials for engineering applications. Our work is highly multidisciplinary and deals with a range of materials such as coatings, surface treatments and composites. Over the last years we have strongly specialized in developing characterization protocols to better describe the materials behaviour of self-healing/dynamic polymers, coatings and biological substances.

My main research interests
Responsive coatings and composites | Novel materials from biological systems | Surfaces and interfaces

I am looking for
Biotechnologists to team up with.

My expertise and technologies to offer
Functional surfaces and interfaces | Polymer structure-property relationships | Materials characterization
Kunal Masania
Materials scientist and mechanical engineer looking for synthetic biologists, microbiologists and plant scientists.

Aerospace Structures and Materials
Shaping Matter Lab
K.Masania@tudelft.nl

About my work
We shape matter at multiple length scales using bottom up self-assembly with top down shaping freedom of additive manufacturing. We like to apply bio-inspired design principles to fabricate useful multifunctional materials with applications ranging from energy, biomedical, filtering/catalysis to aerospace.

My main research interests
Bio-inspired composites | Fabrication using living matter | Data-driven digital design

I am looking for
Synthetic biologists | Plant scientists | Biohybrid specialists

My expertise and technologies to offer
Materials science | Additive manufacturing | Mechanics of materials
Guido de Croon
Expert in AI for robotics looking for biologists with expertise in insect brains & flight behavior.

About my work

I work on the Artificial Intelligence (AI) of small, light-weight flying robots such as the 20-gram flapping wing drone called the “DelFly Explorer”. Such drones form an extreme challenge to AI, because of the strict limitations in onboard sensors, processing, and memory. To tackle this challenge, I draw inspiration from biology, and in particular from flying insects. I study topics such as swarm intelligence, optical flow control, and neuromorphic sensing and computing.

My main research interests
Insect-inspired Artificial Intelligence | Swarm robotics | Neuromorphic sensing and processing

I am looking for
Insect flight behavior | Insect brains

My expertise and technologies to offer
AI for drones (learning, vision, control) | Bio-inspired drones (flapping wing drones)
Julien Dupeyroux
Expert in Neuromorphic AI for Robotics looking for neuro-entomologists for insights in neural processing in the insect brain.

**About my work**
My research goal is to design new models for the processing of visual information in navigating insects (bees, crickets, desert ants), and then test these models on-board robots. The potential outcomes of my work are twofold: improve the understanding of insects visual-based navigation models by providing entomologists with unique data from real-world experiments, and develop disruptive and non-conventional autonomous navigation systems endowed with inherent parsimony and robustness.

**My main research interests**
Biorobotics | Artificial Intelligence | Neuromorphic systems

**I am looking for**
Neuro-entomologists | Expertise in insect vision

**My expertise and technologies to offer**
Visual-based navigation | Insect-inspired robots | Robotics design
Stephanie Cazaux
Planetary sciences expert looking for microbiologists, marine biologists and surface chemists.

Space Engineering
Astrodynamics and Space Missions
S.M.Cazaux@tudelft.nl

About my work
I am working with laboratory experiments to understand the formation and evolution of ices (and composition) in conditions similar to our early solar system. I am working on the plumes (crygesers) on icy moons of our solar system and if life could be present in such conditions and how it could be detected by future missions.

My main research interests
Ices formation, composition, complexity | Formation of the solar system (planets and moons) | Icy moons and sub-surface ocean

I am looking for
Microbiologists | Marine biologists | Surface chemists

My expertise and technologies to offer
Laboratory experiments | Models from laboratory to space
Angelo Cervone
Expert in space propulsion and systems, looking for collaborations on embedded miniaturized systems that can be of bioengineering interest too.

About my work
I have 20 years expertise in space propulsion at all scales (from large rocket engines to miniaturized thrusters) and, more recently, in the design of small satellite missions for exploration of the Solar System. One of my main challenges in the development of miniaturized propulsion systems is the design of heat exchangers of optimized performance, and embedded MEMS sensors and actuators (micro-valves, micro-pumps). On these topics, I believe that there is very good potential for synergies with the bioengineering community.

My main research interests
Space micro-propulsion | Green propellants | Small satellites for terrestrial and interplanetary missions

I am looking for
Microbiologists with research interest in embedded sensors/actuators | Surface chemists

My expertise and technologies to offer
Miniaturized heat exchangers | Integrated MEMS sensors and actuators | Micro-pumps, micro-valves
Marie-Eve Aubin-Tam
Biophysical engineer looking for crystal formation, polymers and materials characterization.

Bionanoscience
Aubin-Tam Lab
m.e.aubin-tam@tudelft.nl

About my work
I am interested in the interplay between structure and mechanics in biological molecules and materials. I have two main lines of research: (1) the study of mechanical processes at the cell membrane, and (2) the production of biomineralized composite materials.

My main research interests
Biomimetic materials | Cell membrane mechanics | Protein conformational dynamics

I am looking for
Crystal formation | Polymers | Materials characterization

My expertise and technologies to offer
Microfluidics | Optical tweezers | Biophysics
Greg Bokinsky
Synthetic microbiologist looking for bioinformaticists, biochemists and synthetic chemists.

About my work
We are curious to learn how bacteria work, and in figuring out ways to make bacteria (even more) useful. We have both fundamental and applied projects, and are always happy to pursue research in new and interesting directions.

My main research interests
Engineering antibiotic production in E. coli (yes, it does work) | Growth-rate regulation in bacteria | Genome mining for iron-sulfur cluster enzymes and cofactors in biotechnology

I am looking for
Bioinformaticists | Biochemists | Synthetic chemists

My expertise and technologies to offer
Bacterial physiology | Metabolic engineering | Synthetic biology
Stan Brouns
Microbiologist and genetic engineer looking for bioinformatics, microfabrication and microbiology.

Bionanoscience
Brouns Lab
S.J.J.Brouns@tudelft.nl

About my work
We are interested in the interaction between microbes and viruses and studies the mechanisms that bacteria and archaea use to protect themselves from virus infection including CRISPR. My lab explores the adaptations that viruses have evolved to avoid defense systems and engineers bacteriophages for phage therapy applications.

My main research interests
Bacteria | CRISPR | Bacteriophage biology and therapy

I am looking for
Bioinformatics | Microfabrication | Microbiology

My expertise and technologies to offer
Microbiology | Virology | Genetic/Genome engineering (CRISPR/Cas9)
Christophe Danelon
Synthetic biology, minimal cell and membrane biophysics expert looking for genome editing and DNA assembly technologies.

Bionanoscience
Danelon Lab
C.J.A.Danelon@tudelft.nl

About my work
We are reconstituting a biological cell from its basic molecular constituents. The essential modules we are building are: a liposome compartment, gene expression, DNA replication, phospholipid synthesis and liposome division. We combine engineering methods with in vitro evolution to implement all modules into a self-replicating synthetic cell.

My main research interests
In vitro evolution | Genome assembly | Mass spectrometry (proteomics, metabolomics)

I am looking for
Genome editing | DNA assembly technologies

My expertise and technologies to offer
Membrane biophysics | Cell-free gene expression | Liposome production
Cees Dekker
Biophysics, nanofabrication and nanobiology expert looking for ultralong DNA, chromatin-related proteins and divisome proteins.

About my work
We employ single-molecule biophysics techniques to survey a variety of subjects from DNA loop extrusion and supercoiling to nanopore studies of nuclear pore complexes and protein sequencing. More recently, our research has focused on studying chromatin structure and cell division with bacteria on chip for synthetic cells.

My main research interests
Chromatin biology | Protein sequencing | Synthetic cells

I am looking for
Ultralong DNA | Chromatin-related proteins | Divisome proteins

My expertise and technologies to offer
Micro/nanofabrication | Single-molecule biophysics techniques
Martin Depken
Theoretical Biophysicist looking for bioinformatics.

Bionanoscience
Depken Group
s.m.depken@tudelft.nl

About my work
I am a theoretical biophysicist specializing in using mathematical/physical modeling to understand how biological function arises from the interactions between molecular components. Of particular interest are the machines that process the information stored in our genomes, and the work is often performed in close collaboration with experimenters.

My main research interests
Transcription | Crispr-CAS | Method development for single-molecule data analysis

I am looking for
Bioinformatics

My expertise and technologies to offer
Theoretical modelling of microscopic phenomena
Kristin Grußmayer
Biophysicist & imaging expert looking for bio-applications for super-resolution & quantitative phase microscopy and for machine-learning/image processing.

Bionanoscience
Grußmayer Lab
K.S.Grussmayer@tudelft.nl

About my work
Quantitative information at the molecular level, ideally in a physiological context, is key to understanding the physical principles that underly cellular organization and (dys)function. In my group, we combine label-free and single molecule super-resolution fluorescence readouts. We develop smart adaptable microscopes & analysis tools and establish new classes of fluorescent probes to enable e.g., quantification of protein clusters, identification of protein interactions and the assessment of mobility & mechanical properties.

My main research interests
Super-resolution microscopy | Optical engineering | Protein oligomerization & self-assembly in neurodegenerative disease

I am looking for
Neurobiology | Machine learning/ Image processing | Bio-applications for advanced imaging

My expertise and technologies to offer
Single-molecule based (super-resolution) imaging and photophysics | 3D quantitative phase imaging | Multiplane imaging
Timon Idema
Theoretical biophysicist looking for cell biologists and experimental biophysicists.

Bionanoscience
Idema Group
t.idema@tudelft.nl

About my work
We study collective dynamics in biological and biomimetic systems, ranging in scale from proteins to populations. On the molecular scale, we study self-assembly in realistic (crowded) environments to get a handle on dynamical processes like cellular signalling, cell motility, and cell division. On the population scale, we investigate how tissues and biofilms form, how they can be influenced, and how they respond to perturbations.

My main research interests
Collective dynamics | Protein interactions | Active matter

I am looking for
Cell biologists | Experimental biophysicists

My expertise and technologies to offer
Theoretical modeling of (bio)physical systems
Arjen Jakobi
Structural biologist looking for micro/nanofluidics, machine learning, image processing and bioinformatics.

About my work
We study the structure and function of biomolecular machines. Biomacromolecules adopt intricate three-dimensional arrangements that are critical to their function. We are interested in the molecular mechanisms by which cells defend themselves against infection. Our research uses electron imaging methods to visualize the macromolecular complexes involved in these processes, and applies biochemical and biophysical tools to dissect their mechanism of action.

My main research interests
Electron cryo-microscopy (cryo-EM) and X-ray crystallography | Structural Biology of pathogen infection | Molecular mechanisms of biomacromolecular machines

I am looking for
Micro/nanofluidics | Machine learning | Image processing

My expertise and technologies to offer
Electron microscopy | Protein crystallography | Structural biology
Chirlmin Joo
Fluorescence expert and single-molecule biophysicist looking for opportunities to collaborate.

About my work
Using cutting-edge single-molecule fluorescence tools, we investigate how small RNA mediates gene silencing (RNA interference) and anti-viral defense (CRISPR immunity and DNA interference). We apply the mechanistic understanding to genome editing. Furthermore, we develop single-molecule protein sequencing techniques for advanced proteomics analysis.

My main research interests
Small regulatory RNA | CRISPR bacterial immunity | Single-molecule proteomics

I am looking for
I am open to explore opportunities for collaboration.

My expertise and technologies to offer
Single-molecule fluorescence (FRET) | Low light imaging | Optical tweezers (cell manipulation and force sensing)
Gijsje Koenderink
Cell and tissue biophysicist with experience in cytoskeleton and extracellular matrix mechanobiology, looking for microscopy experts, biomaterials exerts, and tissue engineers.

Bionanoscience
Koenderink Lab for Biological Soft Matter
g.h.koenderink@tudelft.nl

About my work
We study the material properties of living cells and tissues. Living matter is unique in its ability to combine mechanical strength with active force generation and autonomous change shape. We aim to understand the physical mechanisms that underlie this striking active mechanical behavior. We combine concepts and techniques from soft matter physics, biophysics, synthetic biology, protein engineering, and mechanobiology. We furthermore develop advanced measurement techniques that combine quantitative imaging with force measurements across length scales ranging from the cell/tissue level down to molecular scales.

My main research interests
Cell biology | Mechanobiology | Active soft matter

I am looking for
Advanced microscopy | Tissue engineering | Microfluidics

My expertise and technologies to offer
Rheology | Self-assembly | Advanced microscopy
About my work

My group focusses on evolutionary cell biophysics: how do the self-organisational (physical and chemical) properties of proteins affect the evolutionary dynamics of a biomolecular network? Mostly because it’s fascinating, but also to contribute to research on evolutionary processes relevant for human health, such as cancer progression. We combine experimental evolution and quantitative cell biology in yeast, minimal synthetic systems, reaction-diffusion based modelling and bioinformatics.

My main research interests
Evolutionary biology | Biophysics | Pattern formation

I am looking for
Bioinformatics | Microbial ecology

My expertise and technologies to offer
Minimal reconstituted protein systems | Experimental evolution | Yeast cell biology
Dimphna Meijer
Neuroscientist looking for protein chemists, electrical nanocircuits and in vivo imaging.

Bionanoscience
Meijer Lab
D.H.M.Meijer@tudelft.nl

About my work
My group aims to understand neural circuitry formation on the molecular and atomic level. We use a combination of molecular and cellular biophysics, such as single particle cryo-electron microscopy and high content confocal imaging, to understand how neurons form connections, also known as synapses. The assembly and disassembly of synapses is how we learn – and forget.

My main research interests
Protein Biochemistry | Biophysics of Neural systems | Brain Cancer and Neurodevelopmental disorders

I am looking for
Protein chemists | Electrical nanocircuits | In vivo imaging

My expertise and technologies to offer
Cell biology | Biochemistry (e.g. protein expression and purification) | Neuroscience (e.g. neurons in a dish)
Kristina Djanashvili
Organic synthesis expert looking for imaging in vivo and in vitro, biological evaluation of toxicity and therapeutic effects and physical characterization of nanoparticles.

Biotechnology
Biocatalysis
k.djanashvili@tudelft.nl

About my work
So far, no single existing medical imaging diagnostic technique can offer full advantages in terms of sensitivity and resolution. Therefore, our research is focusing on design of hybrid imaging agents with complementary physical properties and development of the routes for selective targeting with reduced side-effects. The additional objective in this multimodal concept is incorporation of therapeutic components into diagnostic probes (theranostics) enabling simultaneous (radio)therapy.

My main research interests
Chemistry of medicinal imaging and therapy | Chemically identical lanthanides with versatile radio-, magnetic- and optical properties | Small metal-complexes and nanoparticles

I am looking for
Imaging in vivo and in vitro | Biological evaluation of toxicity and therapeutic effects | Physical characterization of nanoparticles

My expertise and technologies to offer
Organic synthesis and coordination chemistry | Nanotechnology | Advanced Nuclear Magnetic Resonance methodologies
About my work
Certain enzymes have metals, and these metal gives them special powers. In order to understand these powers I have developed specific tools (MIRAGE, Nanospec) and use special techniques (calorimetry, EPR spectroscopy) to study these enzymes. This has allowed me to obtain very detailed understanding of the mechanism of action of these enzymes, e.g. the Fe2+ oxidation mechanism of the universal Fe storage enzyme ferritin. I am expanding this further, developing even better tools, studying novel enzymes and unlocking their secrets.

My main research interests
Enzyme discovery and engineering | Metalloproteomics in health and biotechnology | Uncovering enzyme mechanisms

I am looking for
Spectroscopy | Thermal imaging | Radionuclides | Metals in biology

My expertise and technologies to offer
Protein engineering, expression and purification | Electron paramagnetic resonance | Rapid mixing devices for pre-steady state enzyme kinetics.
Ulf Hanefeld
Organic chemist with a keen interest in biocatalysis looking for materials scientists and reaction designers.

Biotechnology
Biocatalysis
U.Hanefeld@tudelft.nl

About my work
I am an organic chemist with a keen interest in catalysis, and in particular biocatalysis. My expertise lies in C-C bond forming enzymes and hydrolases. In collaboration, I am looking for experts on enzymes in unusual locations, and with strange applications. Computational screening for enzymes and their structures, immobilisation and application in continuous reactions, and people working with reaction design and reactor design would be interesting partners to me as well.

My main research interests
Green chemistry | Catalysis | Flow chemistry

I am looking for
Materials scientists | Reaction designers

My expertise and technologies to offer
Carbon carbon bond synthesis | Enzymes in continuous reactions
About my work
We use enzymes as catalysts for chemical transformations as they have a lot to offer to the chemist in terms of mild reaction conditions and selectivity. Particularly, we are interested in enzymatic oxyfunctionalisation reactions, i.e. hydroxylation of non-activated C-H bonds or epoxidations of C=C bonds.

My main research interests
Biocatalysis for chemical synthesis | Enzymatic oxyfunctionalisation reactions | Peroxygenases

I am looking for
Bioinformatics | Protein engineering | Reaction/Reactor engineering

My expertise and technologies to offer
Biocatalysis | Synthetic organic chemistry
Ludovic Jourdin
Microbial electrochemical technology expert looking for microbiologists, material science experts and modelling experts.

Biotechnology
Bioprocess Engineering
L.Jourdin@tudelft.nl

About my work
I develop novel microbial electrochemical technologies for the bioproduction of chemicals, fuels, feed, and food from carbon-containing wastes (e.g. CO₂) and renewable electricity. I particularly focus on bioreactor designs, fundamental understanding of mechanisms occurring at the electrode surface and within biofilms, process integration, and scale up.

My main research interests
Chemicals bioproduction | Biofilms | Bioreactor design

I am looking for
Microbiologists | Material science experts | Modeling experts

My expertise and technologies to offer
Bioelectrochemistry | Electro-fermentation
Marieke Klijn
Analytics-based and data-driven bioprocess expert looking for bioprocesses monitoring challenges targeted for development or optimization.

Biotechnology
Bioprocess Engineering
M.E.Klijn@tudelft.nl

About my work
My research is focused on implementing analytical techniques in upstream bioprocesses to determine the relation between raw materials, production, and product quality via data analytical frameworks. I am interested to contribute to forward/backward process control and (near) real-time release strategies for a variety of biotechnological processes (industrial, environmental, electrochemical, food, biopharma).

My main research interests
Data analytics | Process analytical technology | Upstream processing

I am looking for
Microbiology | Emerging bioprocesses | Sensor development

My expertise and technologies to offer
Protein and bioprocess analytics | Data analysis and visualization
Automation and control
Mark van Loosdrecht
Wastewater treatment expert looking for analysis and characterization of complex biopolymers and bioinformatics.

About my work
We study microbial ecology in engineered systems and design of processes for wastewater treatment and resource recovery based on the obtained knowledge. Our focus is on conversions of nitrogen and phosphate, biofilm systems, effect of dynamic process conditions and role of storage and extracellular polymers in microbial processes.

My main research interests
Biofilm and granular sludge processes | Extracellular polymers | Biological phosphate removal

I am looking for
Analysis and characterization of complex biopolymers | Bioinformatics

My expertise and technologies to offer
Microbial ecology | Process design
Robert Mans
‘Cut, Copy, Paste, and Replace’ with DNA, engineering with evolution and bio-engines expert looking for (polymer) chemists, bio-informaticians and membrane engineers.

About my work
I develop microbial strains with optimized product formation pathways. My specific focus is on modulation of the efficiency at which microbes harvest energy from chemical conversions. I use targeted strain engineering via techniques such as CRISPR/Cas9 to replace native microbial metabolic pathways and subsequent evolutionary engineering to optimize foreign (heterologous) pathways. In the future I aim to use genetically encoded biosensors to engineer robust industrial microbial strains.

My main research interests
Membrane transporters | Bio-energetics | Biosensors

I am looking for
(Polymer) chemists | Bio-informaticians | Membrane engineers

My expertise and technologies to offer
Microbial evolution | Metabolic engineering | Quantitative bioreactor cultivation
Rinke van Tatenhove-Pel
Synthetic consortia and flow cytometry expert looking for experts in enzyme-assays, microfluidics and FACS sorting.

About my work
My main areas of interest are interactions between cells, strains and species, and the development of high-throughput screening and selection systems. My research combines defined synthetic consortia, predictive models and laboratory experiments, to gain knowledge and insight that I use to improve biotechnological processes. I often work with water-in-oil emulsions as a screening and selection tool.

My main research interests
Defined microbial consortia | High-throughput screening | Evolution of microbial interactions

I am looking for
Enzyme assays | Microfluidics | FACS

My expertise and technologies to offer
Selection in water-in-oil emulsion | Flow cytometry (microbial) | Synthetic consortia
Duncan McMillan
Bioelectrochemist, biophysicist and molecular microbiologist looking for microbiologists, nanofabrication and surface chemists.

Biotechnology
Biocatalysis
d.g.g.mcmillan@tudelft.nl

About my work
The Membrane Bioenergetics Unit (MBU) is headed by Assistant Professor Dr Duncan McMillan. The overarching theme of the research of the MBU is focused on ‘energy and life’ exploring microbial physiology using classical microbiology and biochemistry, biomimetic membrane technologies and single-molecule biophysics. With this fundamental knowledge we investigate the adaptations of life to selective environmental pressures with particular focus on the function of the cell membrane, and the role of respiratory enzymes in health and disease.

My main research interests
Regulation and function of respiratory chain components | The role of metals in respiratory enzymes and their function in electron transfer | Protein-protein and protein-lipid interactions

I am looking for
Microbiologists | Nanofabrication | Surface chemists

My expertise and technologies to offer
Biochemistry of membrane/soluble proteins | Enzyme kinetics | Biomimetic membranes
Martin Pabst
Protein mass spectrometrist/microbial proteomics and glycoproteins expert looking for bioinformatics, fluorescence imaging and statistics.

Biotechnology
Cell Systems Engineering
m.pabst@tudelft.nl

About my work
We are performing research on microbial protein modifications which are utilised to regulate important functions of a cell like for modulating enzyme activities in metabolic pathways. The focus thereby is on cell systems with relevance for industrial applications. Furthermore, we are interested in exploring how microbes work together by characterising biofilm components such as proteins and carbohydrates using meta-proteomics approaches.

My main research interests
Post-translational protein modifications | Bacterial communities | High-resolution and quantitative mass spectrometry

I am looking for
Bioinformatics | Fluorescence imaging | Statistics

My expertise and technologies to offer
High-resolution and quantitative mass spectrometry | Protein chemistry | Proteomics
About my work
Our current research interests are focused on the use of synthetic and orthogonal cofactors for oxidoreductase and transferase enzymes to catalyse chemical reactions, with an emphasis on the development of non-natural enzymatic reactions for applications in pharma- and fine chemical industries. We are interested in exploiting the catalytic mechanism of enzymes, improving the overall robustness of the reaction, and targeting the synthesis of valuable compounds.

My main research interests
Enzyme-catalyzed reactions | Synthetic and orthogonal cofactors for enzymes

I am looking for
Other researchers open for collaborations! | Materials Bioinformatics | Structural biology

My expertise and technologies to offer
Biocatalysis | Synthetic organic chemistry
Cees Haringa
Modelling/fluid dynamics researcher looking for cell-response, process analysis and scale-up challenges, from cell cultures and biorefineries to wastewater treatment.

About my work
I assess bioprocesses from the cellular point of view: how do cells experience (varying) environments, and how does this affect their response and overall process performance. My expertise is the use of computational fluid dynamics, coupled with cell-response models, to gain insights in industrial processes. These models can be applied towards several goals: process scale-down, strain screening/optimization under industrially representative conditions and process improvement, as well as towards development of new process control tools and digital twins.

My main research interests
Bioreactor hydrodynamics | Scale-down | Process modelling

I am looking for
Microbiologists | Bioprocess engineers | Analytical experts

My expertise and technologies to offer
Computational fluid dynamics | Transport phenomena | Scale-up/scale-down
Aljoscha Wahl
Microbial metabolism expert looking for membrane proteins, high performance computation and single cell approaches.

**About my work**
Metabolism is the ‘engine’ of microbial live, generating energy redox equivalents and precursors for growth. Its sustained operation by networks of enzymatic reactions forms a complex network that requires fine-tuned regulation. Identifying the underlying kinetics and understanding the regulatory mechanism of metabolism is our aim. We perform microbial experiments in controlled bioreactor environments, design and perform tracer experiments (13C carbon tracing) and kinetic modeling for industrial but also environmental microorganisms.

**My main research interests**
Microbial cells | Systems biology | Biofuels

**I am looking for**
Membrane proteins | High performance computation | Single cell approaches

**My expertise and technologies to offer**
Systems biology | Metabolite analytics | Dynamic modelling
Pouyan Boukany
DNA dynamics, bio-microfluidics and cell mechanics expert looking for cell biology, surface modification and high resolution imaging.

About my work
My group focuses on fundamental and applied topics in soft living matter, with a major emphasis on controlling and understanding the dynamics and transport of DNA into living cells. To do this, we apply cutting-edge micro/nano-fluidic technologies to manipulate and control the DNA and biomolecules for both fundamental biophysical studies and applications, such as non-viral gene therapy, biosensing and cancer therapy.

My main research interests
Biophysics | Cell membrane | Molecular crowding

I am looking for
Cell Biology | Surface modification | High resolution imaging

My expertise and technologies to offer
Non-viral gene/drug delivery | Microfluidics | Single-cell/DNA manipulation
Rienk Eelkema
Synthetic organic, polymer chemistry and soft matter expert looking for hybrid materials (living/non-living), functionalization of biomolecules and healthcare materials.

Chemical Engineering
Rienk Eelkema Lab
r.eelkema@tudelft.nl

About my work
Our research is concerned with the design, synthesis, characterization and application of new soft molecular materials. We have a special focus on using in situ chemical reactivity to control the assembly of dynamic materials and the stability of polymers, to make materials that can respond to changes in their environment and their application in drug release, and the selective functionalization of biomolecules.

My main research interests
Signal transduction in organic materials | Controlled release materials | Selective functionalization of biomolecules

I am looking for
Hybrid materials (living/non-living) | Functionalization of biomolecules | Healthcare materials

My expertise and technologies to offer
Synthetic organic chemistry | Self-assembly | Characterization of molecular structure and soft matter microstructures
Valeria Garbin
Expert in stretching, breaking, and otherwise deforming soft and biological materials looking for microbiology, bioprocessing and tissue engineering.

Chemical Engineering
Transport Phenomena
v.garbin@tudelft.nl

About my work
I study soft and biological materials under flow and deformation, particularly the extreme deformation conditions of cavitation (high strain and high strain rate). Extreme deformation conditions due to cavitation are encountered at the tissue level for instance in blast traumatic brain injury; and at the cell level in bioprocessing. In my group we have developed experimental techniques to characterize the coupled fluid dynamics and soft/biological material deformation at high strain rates.

My main research interests
High-strain-rate deformation of soft/biological materials | Cell rupture due to ultrasound and cavitation | Mechanical phenotyping of cells in microfluidics

I am looking for
Microbiology | Bioprocessing | Tissue engineering

My expertise and technologies to offer
High-frequency rheology of soft materials (e.g. hydrogels) | Interfacial rheology (e.g. lipid or protein monolayers, lipid bilayers) | Ultrasound, cavitation and bubble dynamics
Eduardo Mendes
Advanced soft matter expert looking for cell biologists, neuron experts and immune system experts.

Chemical Engineering
Advanced Soft Matter
E.Mendes@tudelft.nl

About my work
My research focuses on the study of soft (responsive) matter, mainly gels and self-assembled structures and their interface with the living. Using techniques such as microfabrication, printing and microfluidics, I develop (gel) responsive particles or surfaces with potential use in therapy, tissue engineering and sensing (diagnosis).

My main research interests
Responsive gels | Cell behaviour/interaction with soft surfaces | Sensing

I am looking for
Cell biologists | Neuron experts | Immune system experts

My expertise and technologies to offer
Soft Matter processing and properties | Soft Matter characterization | Smart/responsive gels
Stephen Picken
Polymer materials physicist looking for biobased materials and applications.

Chemical Engineering
Advanced Soft Matter
s.j.picken@tudelft.nl

About my work
I am an expert on polymer materials, in particular in the field of liquid crystal polymers and (bio)polymer nanocomposite based systems. My work is aimed at using modelling and structural characterization methods to elucidate the structure-property relations in such materials, including the dynamics during formation and in the final material.

My main research interests
(Bio)polymer nanocomposites | Dynamics | Structure-property relations

I am looking for
Biobased materials and applications

My expertise and technologies to offer
Structure formation and characterization | Thermal and solution processing | Designer materials
Luis Portela
Fluid mechanics expert looking for micro-organism models, micro-organisms genetics and dynamics of biological systems.

Chemical Engineering
Transport Phenomena
l.portela@tudelft.nl

About my work
My research focus on complex engineering flows, in particular, involving multiphase flow and turbulence. I am interested in theoretical, numerical and experimental work. My work covers a wide range of topics, from fundamental studies on particle-laden turbulent flows, to multiphase flows in (bio) chemical processes. I am interested in studying bio-reactors from an holistic perspective, combining the micro-organisms (genetic) aspects with the entire fluid transport processes.

My main research interests
Fluid Mechanics | Complex Systems | Phenomenological Modelling

I am looking for
Micro-organisms models | Micro-organisms genetics | Dynamics of biological systems

My expertise and technologies to offer
Fluid Mechanics | Numerical Methods | Experimental Techniques
Alina Rwei
Drug delivery and bioelectronics expert looking for computational modelling of self-assembled lipid/polymeric systems and signal processing.

Chemical Engineering
Product and Process Engineering
A.Y.Rwei@tudelft.nl

About my work
My work merges the two pillars of healthcare technologies: diagnostic systems and therapeutics, with the goal of achieving a closed-loop therapeutic system, in which therapeutics can be release based on real-time physiological states of a patient. More specifically, the diagnostic systems I am focusing on are soft, miniaturized wearable and implantable electronics; the therapeutic systems I focus on are actively-triggerable smart drug delivery systems, such as light- and ultrasound-triggerable release of local anaesthetics to achieve on-demand pain relief.

My main research interests
Smart drug delivery systems | Wearable and implantable soft bioelectronics | Pain therapy

I am looking for
Computational modelling | Machine learning | In vivo imaging

My expertise and technologies to offer
Drug-encapsulating particles | Stretchable sensors
Artur Schweidtmann
Artificial Intelligence (AI) expert looking for joint machine learning (ML) and optimization projects with bio partners.

Chemical Engineering
Product and Process Engineering
A.Schweidtmann@tudelft.nl

About my work
I am a chemical engineer with background in machine learning, artificial intelligence, and optimization. For example I design algorithms for automated experimental setups for the optimization of yield and selectivity.

My main research interests
Machine learning | Artificial intelligence | Optimization

I am looking for
Interesting research collaborations that have a positive impact on our society.

My expertise and technologies to offer
Data analysis | Optimization | Self-optimization with automated experiments in the loop
Daan Brinks
Neurophysicist looking for protein evolution, biostatistics and genome editing.

Imaging Physics
The Brinks Lab
d.brinks@tudelft.nl

About my work
My lab addresses neuroscience questions through functional imaging. We develop tools with roots in physics, biochemistry, optics, mathematics and nanofabrication and we’re interested in how brain cells work on every level, from biophysical principles to consequences in behavior and from subcellular compartments to complete organisms. Our main workhorses right now are Genetically Encoded Voltage Indicators, which we develop and apply.

My main research interests
Multiphoton voltage imaging | Functional nanoscopy | The role of bioelectricity in embryonic development

I am looking for
Protein evolution | Biostatistics | Genome editing

My expertise and technologies to offer
Nonlinear imaging | In vitro & In vivo functional imaging | Neuroscience
Elizabeth Carroll
Opto-neuro-bio-physicist looking for experts in molecular biology, developmental biology and neuroscience.

Imaging Physics
Zebrafish Development Lab
e.c.m.carroll@tudelft.nl

About my work
My lab uses interdisciplinary science and engineering approaches to develop optical imaging methods for the study of animal physiology. We design unique microscopes and novel biosensors that make it possible to combine multiple scales of spatial, temporal, and chemical resolution. With the tools we build, we address systems-level questions from neurobiology, immunology and toxicology using zebrafish as a small animal model.

My main research interests
Neuro/endocrinology | Systems biology | Neuroscience

I am looking for
Molecular biology | Developmental biology | Neuroscience

My expertise and technologies to offer
Zebrassh | Light sheet microscopy | Optogenetics
Hylkje Geertsema
Single-molecule and super-resolution microscopy expert looking for spatial, temporal and spatiotemporal analysis of biological processes in vitro and in cells.

Imaging Physics
H.J.Geertsema@tudelft.nl

About my work
I perform single-molecule imaging and super-resolution microscopy to obtain spatiotemporal information on biological processes in eukaryotic cells, especially in the nucleus. In specific, my interest lies in understanding how DNA replication is initiated and how it is regulated in space and time during the cell cycle. I focus on single proteins, e.g. PCNA, within the DNA replication machinery by imaging single proteins that are genetically fused to a fluorescent protein in vivo or by super-resolution microscopy with DNA-PAINT in situ.

My main research interests
Super-resolution microscopy | Single-molecule imaging | DNA replication

I am looking for
Cell biologists | Biological processes in the nucleus | Cellular labelling methods

My expertise and technologies to offer
Single-molecule imaging | DNA-PAINT | Cellular labelling methods
Jeroen Kalkman
Imaging expert fascinated by optical tomography looking for life scientists with challenging imaging problems.

Imaging Physics
Kalkman Lab
J.Kalkman@tudelft.nl

About my work
I am fascinated by optical tomography and making cool imaging tools. My focus is on label-free imaging in 3D with optimal imaging performance (resolution, speed, and volume) and quantification of sample parameters. Besides a focus on quantitative zebrafish imaging, we also measure the composition of flowing (bio) suspensions, biofilm growth, plant morphology, and tissue morphology.

My main research interests
Optical tomography | Optical signal processing | Zebrafish

I am looking for
Life scientists with challenging imaging problems

My expertise and technologies to offer
Optical tomography | Optical signal processing | Microscopy
David Maresca
Ultrasound imaging expert looking for protein engineering and synthetic biology.

Imaging Physics
Medical Imaging/Maresca Lab
d.maresca@tudelft.nl

About my work
Visualizing cellular processes occurring deep with living organisms is essential to our understanding of biology and disease. To address this challenge, we pursue fundamental advances at the interface of ultrasound imaging and molecular engineering, taking advantage of the discovery of acoustic biomolecules to interface ultrasound waves with cellular processes.

My main research interests
Biomedical ultrasound imaging | Ultrasound imaging of neural activity

I am looking for
Protein engineering | Synthetic biology

My expertise and technologies to offer
Biomolecular ultrasound imaging | Hemodynamic functional ultrasound imaging of neural activity | Genetically encoded acoustic biomolecules (also known as gas vesicles)
Expert in optical engineering in general and super-resolution microscopy in particular looking for applications in (single-molecule) imaging and sensing using optics.

Imaging Physics
Computational Imaging
S.Stallinga@tudelft.nl

About my work
My research focuses on the intersection between the fundamentals and engineering of optical imaging systems and image processing algorithms (“computational imaging”). This combination makes it possible to see what cannot be made visible with conventional optical imaging instrumentation. We apply this to super-resolution microscopy to achieve nanometer resolution, and to develop automated slide scanning solutions for digital pathology.

My main research interests
Computational imaging | Optical engineering | Super-resolution microscopy

I am looking for
Microbiologists | Nanofabrication | Surface chemists

My expertise and technologies to offer
Optical design and modeling | Image analysis
Sebastian Weingärtner

MRI physicist looking for exciting imaging applications of functional and cellular properties.

Imaging Physics
Magnetic Resonance Systems (Mars) Lab
s.weingartner@tudelft.nl

About my work
We develop novel methods in Magnetic Resonance Imaging physics to depict previously undetectable properties on the micro-, meso- and macroscopic scale in-vivo. This spans work on signal modelling, quantitative imaging biomarkers, as well as novel imaging techniques for functional brain imaging. Most of our experiments are done on clinical MRI machines at field strengths 1.5T – 7T, enabling the direct application to human subject.

My main research interests
Magnetic Resonance Imaging | Functional neuroimaging | Imaging of cellular properties in-vivo

I am looking for
Neuroimaging | Tissue/animal models

My expertise and technologies to offer
Magnetic Resonance Imaging | In-vivo imaging | Functional neuroimaging
Antonia Denkova
Radiochemist and soft matter engineer looking for imaging in vitro, bioassay development and microfluidics.

About my work
My research focuses on the development of radionuclide therapy for cancer treatment aiming at decreasing collateral damage while maximizing tumor damage. The research consists of determining the best radioisotope depending on the tumor characteristics, optimizing the production of these radioisotopes, developing methods to bring these radioisotopes to the targeted area and final evaluation in vitro and in vivo.

My main research interests
Radiation effects on cells | Development of delivery systems for radioisotopes | Neutron activation of different compounds including chemotherapeutics

I am looking for
Imaging in vitro | Bioassay development | Microfluidics

My expertise and technologies to offer
Preparation of radiotracers for life science experiments | In vitro evaluation 2D and 3D | Soft matter nano-systems loaded with chemotherapeutics or radionuclides
Marlies Goorden
Imaging physicist looking for biological and biomedical applications for radionuclide and CT imaging.

Radiation Science & Technology
Biomedical Imaging
m.c.goorden@tudelft.nl

About my work
I am a physicist working on the development of new technologies and image reconstruction algorithms to improve radionuclide imaging (SPECT-PET). Together with industrial partners and academic medical centers I have developed high-resolution tomography for small experimental animals with unprecedented resolutions that can image radioisotopes with a very broad range of energies and in different combinations (multi-isotope imaging). My expertise mainly lies in theoretical analysis of scanner geometries, optimization through simulations and development of new image reconstruction algorithms.

My main research interests
Radionuclide imaging | Image reconstruction | Scanner optimization

I am looking for
Biological and biomedical applications for radionuclide and CT imaging

My expertise and technologies to offer
Small animal SPECT | Small animal PET | MicroCT
Robin de Kruijff
Radiochemist and (radio)tracer expert looking for bio-applications for mineral tracer based metabolism studies and radiopharmaceutical development physicians.

**Radiation Science & Technology**
Applied Radiation and Isotopes
R.M.deKruijff@tudelft.nl

**About my work**
In my work, I focus on the use of radionuclides for medical applications. This includes developing new production routes for radionuclides using our nuclear reactor, investigating their potential as radiopharmaceutical for cancer therapy, and using radionuclides to study the bioavailability and metabolism essential minerals. As such, I aim to (1) develop (radio)isotopes for disease diagnosis or treatment, (2) obtain a better understanding of human and animal metabolism, and (3) evaluate the uptake, distribution, intercompartmental kinetics and excretion of metals.

**My main research interests**
Radionuclide productio | Microfluidics | (Radio)tracers

**I am looking for**
Metalloproteomics experts | Nutritional researchers | Radiopharmaceutical development physicians

**My expertise and technologies to offer**
Isotope separation technologies | Non-destructive isotopic analysis based on neutron activation | Radiotracer development
Zoltán Perkó
Computational physicist looking for bioinformatics, radiobiology and in-vivo imaging.

Radiation Science & Technology
Reactor Physics and Nuclear Materials
z.perko@tudelft.nl

About my work
My research focuses on novel radio- and proton therapy treatment planning approaches for cancer treatment. These include handling uncertainties (arising from e.g. patient positioning and proton range errors, breathing and organ motion), quantifying treatment robustness, developing robust optimization methods, optimizing radiotherapy fractionation and combined modality treatments, building decision support tools and exploring biology based treatment planning.

My main research interests
Biology based radiotherapy treatment planning | Robust/probabilistic proton therapy treatment planning | Uncertainty quantification method development

I am looking for
Bioinformatics | Radiobiology | In-vivo imaging

My expertise and technologies to offer
Treatment optimization | Numerical modelling | Sensitivity and uncertainty analysis
Albert van de Wiel
Senior consultant in internal medicine and isotope research looking for opportunities to collaborate.

About my work
Our work concerns the application of both stable and radioactive isotopes in clinical medicine. I focus on stable isotopes, my colleague Antonia Denkova on radioactive isotopes.

My main research interests
Multi-element analysis in human material | Application of enriched stable isotopes in clinical research | Radionuclides in diagnostic procedures

I am looking for
Opportunities for collaboration

My expertise and technologies to offer
INAA | Radiochemistry | Contacting clinical researchers
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Bioengineering
Principal Investigators Booklet

Production
Nienke van Bemmel

Graphic design
Judy Ballast

Contact
N.vanBemmel@tudelft.nl