

# SYMPOSIUM TOWARDS IPP-TU/e COLLABORATION IN COMPUTATIONAL FUSION PHYSICS

14 November 2017

14:00 - 18:00 hrs

De Zaale 20

5612 AJ Eindhoven



**DIFFER**  
Dutch Institute for  
Fundamental Energy Research

## AGENDA

- 14:00** Introductions
- 14:10** Frank Jenko (Head of Tokamak Theory Division IPP Garching): *Creating a Virtual Fusion Plasma: An Interdisciplinary Grand Challenge with Enormous Potential*
- 15:10** Break
- 15:20** Harald van Brummelen (Multi-scale Engineering Fluid Dynamics)
- 15:40** Jack van Wijk: *Data visualization and visual analytics*
- 16:00** Herman Clercx: *Transport in anisotropic turbulent flows: numerical simulations and laboratory experiments*
- 16:20** Break
- 16:30** Vlado Menkovski: *Learning to simulate physics with Machine Learning*
- 16:50** Hans van Dommelen: *Multi-scale modelling of structure evolution in tungsten under irradiation and heat loads*
- 17:10** Borrel (*informal drinks*)

### Abstract Frank Jenko talk

*The pursuit of fusion energy aims at bringing the energy-producing power of a star to earth for the benefit of humankind. The promise is enormous: an energy system whose fuel is abundant and which yields zero carbon emissions to the atmosphere. However, fusion research has been identified as one of the most challenging scientific and technological programs ever undertaken. At the heart of this effort is the goal to understand ionized gases (i.e., plasmas) which have all the traits of quintessential complex systems: high dimensionality, nonlinearity, as well as omnipresent multi-scale and multi-physics couplings. Therefore, the holy grail of fusion theory is to create a virtual fusion plasma which provides a validated predictive capability. This calls for a concerted interdisciplinary effort, involving applied mathematics, computer science, complex systems research, materials science, and of course plasma physics. The present talk will provide an introduction and overview to this topic, outlining some of the outstanding challenges and opportunities.*

Further discussions: On Wed Nov 15, Frank Jenko will be available for further discussions with interested parties, regarding potential collaboration projects. Those who are already interested can mention this in the registration e-mail to book a slot. Otherwise, a slot from Nov 15 can be booked in person on Nov 14 as well.

**Registration:**  
please send Jonathan Citrin (J.Citrin@diffier.nl) your name and affiliation.

# MAP OF EINDHOVEN UNIVERSITY OF TECHNOLOGY AND WALKING ROUTE FROM THE STATION TO DIFFER

**TU/e**  
 Technische Universiteit  
 Eindhoven  
 University of Technology

## Visiting address

Technische Universiteit Eindhoven  
 De Zaal, 5612 AI Eindhoven  
 T: +31 (0)40 247 9111

## Buildings

NAME	MAP	NO.
Athene	C5	16
Auditorium	B4	1
BBC (Resistofocentrum)	EA	70
Cascade	DA	23
Catalyst	E3	76
Ceres	C4	7
Connector	D3	60
Corona	C3	
Cyclotron	D5	24
Differ	E4	73
Echo	E5	28
Flux	DA	19
Fontys H4	EA	87
Fontys S1	D3	54
Fontys S2	D3	55
Fontys S3	D3	59
Gaslab	B5	12
Gemini	C4	15
Hoofdgebouw	B4	3
Helix	C5	14
Impuls	B3	
IPO	D3	57
Kennispoort	A5	2
Koepel	F4	
La Place	C4	32
Matrix	B5	10
MetaForum	C4	5
Meulenstein Art Centre	EA	72
Momentum	EA	74
Multimedia paviljoen	E3	74
Paviljoen	E2	62
Potentiaal	C3	31
Spectrum	D4	25
Studentensportcentrum	C2	49
TNO	C5	20
Traverse	C3	37
Twinning center	E3	77
Vertigo	B5	6
Zwarte Doos	B5	4

## Departments

NAME	BUILDING
Applied Physics	Flux
Biomedical Engineering	Gemini
Chemical Engineering and Chemistry	Helix
Department of the Built Environment	Vertigo
Eindhoven School of Education	Traverse
Electrical Engineering	Flux
Industrial Design	Laplace
Industrial Engineering & Innovation Sciences	IPO
Industrial Engineering & Innovation Sciences	Connector
Industrial Engineering & Innovation Sciences	Paviljoen
Mathematics and Computer Science	MetaForum
Mechanical Engineering	Gemini
Darcy-lab	Gemini
High Tech Systems Center	Matrix
Supermarkt SPAR University	Flux



Eindhoven station