FKKT | UNIVERZA V LJUBLJANI
Fakulteta za kemijo in kemijsko tehnologijo

VABILO NA PREDAVANJE
V OKVIRU DOKTORSKEGA ŠTUDIJA
KEMIJSKE ZNANOSTI / INVITATION TO THE
LECTURE WITHIN DOCTORAL PROGRAMME IN
CHEMICAL SCIENCES

Prof. dr. Jörg Fitter

RWTH Aachen University
I. Physikalisches Institut (IA)

z naslovom / title:

Single molecule FRET for probing biomolecular structure, dynamics and interactions

v sredo, 19. 11. 2025 ob 15. uri
v predavalnici 1 v 1. nadstropju Fakultete za kemijo in kemijsko tehnologijo, Večna pot 113 ***/***
on Wednesday, 19. 11. 2025 at 15.00
in lecture room 1, 1st floor at the Faculty of Chemistry and Chemical Technology, Večna pot 113

Vljudno vabljeni! / Kindly invited!

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Abstract:

When considering biological processes at the molecular level, structure, conformational changes, structural dynamics, and the interaction between biological macromolecules play a central role. Various fluorescence spectroscopy techniques provide a very powerful experimental approach to the essential parameters. Due to the high sensitivity and selectivity underlying the technique, enormous progress has been made in the field of molecular structural biology in recent decades, particularly with the use of Förster resonance energy transfer (FRET). The outstanding features of FRET spectroscopy are: (i) high spatial resolution of 0.1 nm on the size scale of biological macromolecules (few nm), (ii) measurements at the single-molecule level are possible due to the enormous sensitivity of fluorescence, and finally (iii) with time-resolved measurements, structural dynamics can be measured down to the nanosecond range. This colloquium lecture will introduce and discuss the fundamentals of FRET technology [1,2] and numerous applications in the fields of protein folding [3,4], FRET-based biosensors [5,6], analysis of high-affinity macromolecular binding [7], as well as applications of microfluidic channels in FRET measurements [2].

[1] G. Hamilton et al., in *Spectroscopy and dynamics of single molecules*, 269-333, Elsevier (2019)
[2] D. Nettels et al., *Nat. Phys. Rev.* 6, 587–605 (2024)
[3] M. Cerminara et al., *Biophysical Journal*, 118, 688-697 (2020)
[4] N. Bustorff & J. Fitter, *Biomolecules*, 13, 1280 (2023)
[5] H. Höfig et al., *ACS Sensors*, 3: 1462-1470, (2018)
[6] I. Reinartz et al., *Sensors*, 21, 4144 (2021)
[7] B. Schedler et. al, *Int. J. Mol. Sci.,* 24, 16379 (2023)