Tokyo University of Agriculture and Technology
Institute of Global Innovation Research

グローバルイノベーション研究院　公開セミナー
Institute of Global Innovation Research Open Seminar

Controlling nanoparticle transport and capture in nanopores: an open challenge for nanopore sensing and energy applications

Dr. Mauro Chinappi

Dipartimento di Ingegneria Industriale,
Università di Roma Tor Vergata, Roma, Italia.

Thursday, March 19 2020, 16:00 ~

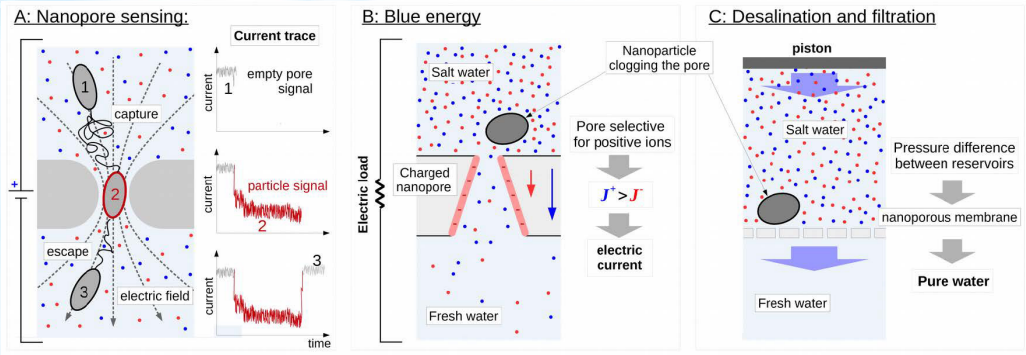
言語 / 英語　Language / English

どなたでも、ご聴講いただけます。
Everyone is welcome to attend.

東京農工大学　小金井キャンパス 工学部13号館L1331
Room L1331, Building 13, Koganei Campus, TUAT

Abstract:

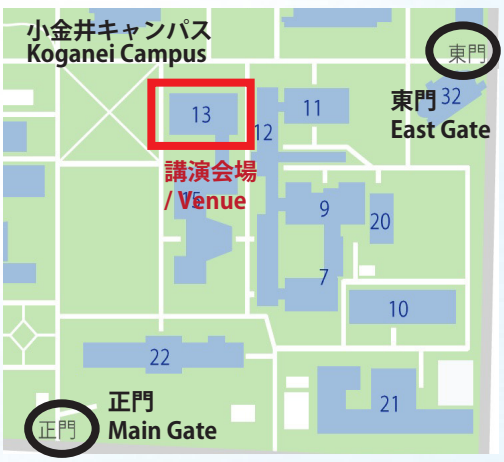
Nanopore based devices have been revolutionizing several key-applications such as biosensing, energy harvesting and water treatment. The interaction between dispersed nanoparticles (e.g. biological macromolecules or artificial nanometric solid objects) and the nanopores plays a crucial role in all cited technologies. In sensing applications [1], selected molecules must be easily captured by the pore while the capture of unwanted molecules has to be avoided. Instead, in blue-energy harvesting and nanopore based water treatment systems, nanoparticles can clog the pore, dramatically reducing the system efficiency. Technological advancements are hindered by our lack of control and understanding of the coupling between hydrodynamics, electrokinetics and chemical effects that govern the nanoparticle motion at nanoscale.
An additional challenge is the nanometric scale of the system that makes the usual continuum modelling often unsuitable.
In this talk, I will present the main challenges related to capture and transport of nanoparticles through nanopores, the possible computational techniques to unravel transport regimes (ranging from atomistic models to continuum approaches [1]) and some preliminary results concerning two specific issues, namely, electroosmotic induced capture [2] and dielectrophoretic trapping (nanopore tweezers [3-4]).



■共催 / Co-Organized by
グローバルイノベーション研究院 ライフサイエンス分野　篠原チーム
Institute of Global Innovation Research, "LIFE SCIENCE" Shinohara Team

卓越大学院プログラム
Excellent Leader Development for Super Smart Society
by New Industry Creation and Diversity

WISE-TUAT



■お問合せ先／Contact
グローバルイノベーション研究院　工学研究院　川野　竜司
Institute of Global Innovation Research, Institute of Engineering
Prof.　Ryuji Kawano
Email: rjkawano (ここに@を入れてください) cc.tuat.ac.jp

詳細はホームページをご覧ください
Please refer to our website for more information

URL: https://www.tuat-global.jp
https://www.tuat-global.jp/english/