UC San Diego
JACOBS SCHOOL OF ENGINEERING
NanoEngineering

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# Hybrid SEMINAR SERIES

**Wednesday, November 23rd, 2022**
**Seminar Presentation: 11:00am – 12:00pm**
**SME room 248**

## *"Spectroscopy to explore organic semiconductors: From solar cells to bioelectronics"*


**Dr. Natalie Banerji, PhD**

*Professor of Physical Chemistry*
*University of Bern*



**Abstract:** We use ultrafast spectroscopic techniques, such as transient absorption (TA) and time-domain terahertz (TD-THz) spectroscopies, to investigate charge carriers in organic semiconductors. While femtosecond TA measurements bring insights to the nature and evolution of photoexcited species, we use TD-THz spectroscopy to gain information about the charge transport properties at the nanoscale. Processes of interest include charge generation in organic photovoltaics (OPVs) and electrochemical doping in organic electrochemical transistors (OECTs). In this talk, I will first show results about free charge dynamics in highly efficient organic solar cell materials containing non-fullerene acceptors (NFAs). Then, I will describe ways to explore spectroscopy to study organic bioelectronics. In operando visible, Raman and TD-THz measurements on OECTs will be presented.


**Biosketch:** Natalie Banerji is currently a Full Professor of Physical Chemistry at the University of Bern. Her research interests include the study of organic and hybrid materials using ultrafast spectroscopic techniques, in view of solar cell and bioelectronic applications. She studied Chemistry at the University of Geneva and obtained her Ph.D. in Physical Chemistry in 2009, under the supervision of Prof. Eric Vauthey. She then moved to the University of California in Santa Barbara (USA), to work on organic solar cells during a post-doctoral stay with Nobel Laureate Prof. Alan J. Heeger (2009-2011). In 2011, she was given the opportunity to start her independent research career in Switzerland at the Ecole Polytechnique Férérale de Lausanne (EPFL) with an Ambizione Fellowship by the Swiss National Science Foundation (SNSF). She obtained an SNSF-Professorship at the University of Fribourg (Switzerland) in 2014, and was subsequently nominated tenured Associate Professor in 2015. She was President of the Chemistry Department in Fribourg form 2016-2017 and moved to Bern in 2017. In 2015, she obtained the Grammaticakis-Neumann Prize (Swiss Chemical Society) and in 2016, she was awarded an ERC Starting Grant. She is currently also part of the Swiss Research Council and Associate Editor of ACS Materials Letters.

**Host: Darren Lipomi/ Email: dlipomi@ucsd.edu**