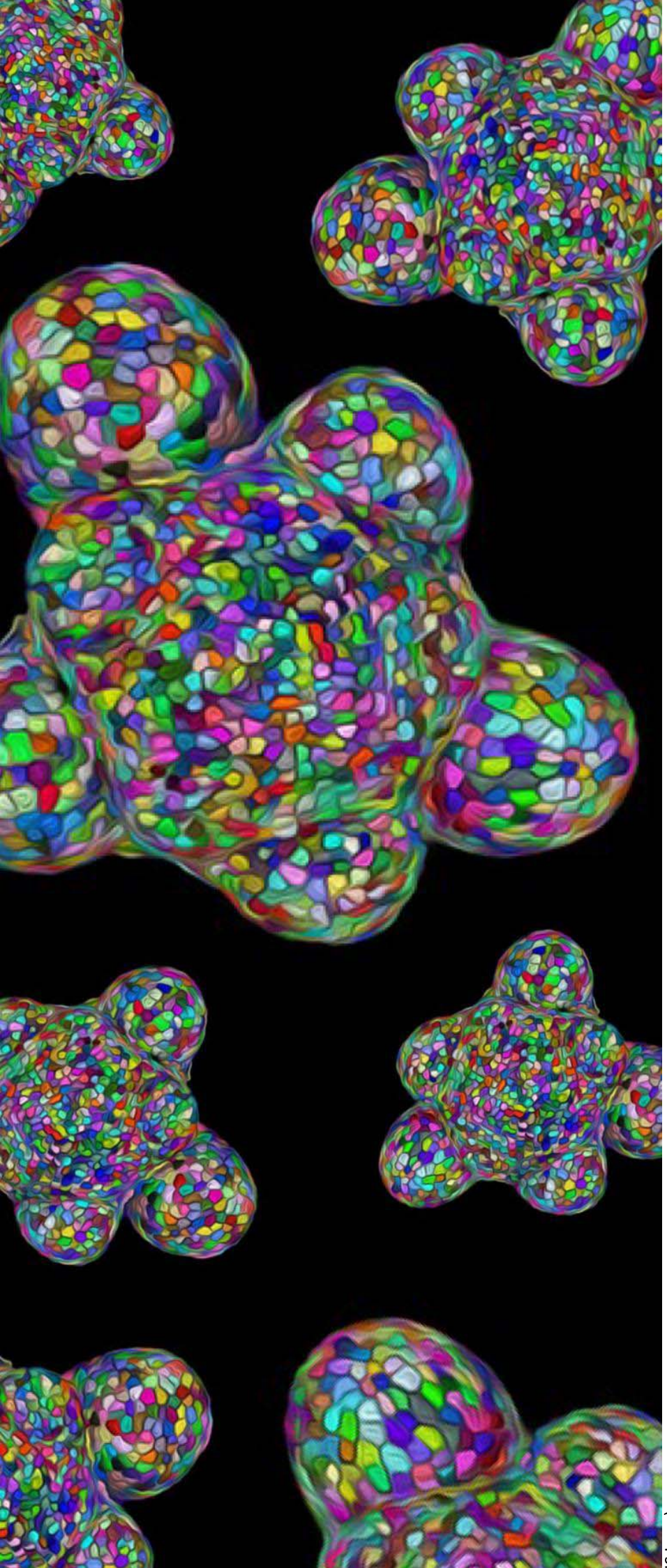

IS Lyon)

4th International Confere

Physics &
Biologica
Systems

October 22-24 2018

CNRS campus, Gif-sur-Yv

Invited speakers:

Arezki Boudaoud (ENS Lyon, France)
Giovanni Cappello (U. Grenoble Alpes,
Guillaume Charras (UCL, UK)
Sarah Cuylen-Häring (EMBL, Germany)
Ulrike Endesfelder (MPI for Terrestrial
Benjamin Engel (MPI of Biochemistry,
Valérie Gabelica (U. Bordeaux, France)
Gary Karpen (UC Berkeley, USA)
Laëtitia Kurzawa (CEA Grenoble, Franc
Amélie Leforestier (Université Paris-Su
Laura Marcu (UC Davis, USA)
Boris Martinac (University of New Sou
Davide Marenduzzo (University of Edi
Elliot Meyerowitz (Caltech, USA)
Thomas Perkins (University of Colorad
Rob Phillips (Caltech, USA)
Catherine Picart (U. Grenoble, France)
Rudi Podgornik (UCAS, China)
Yitzhak Tor (UC San Diego, USA)
Shelly Tzlil (Technion, Israel)
Tomaso Zambelli (ETH Zurich, Switzerla

Student & Poster Sessions

Program & registration: http://l

Note: free registration for stu

Structural study of lipid droplet using synchrotron label free multimodal imaging

Frédéric Jamme (Soleil Synchrotron, France)
Isabelle Bouchez (IJPB, INRA AgroParisTech CNRS, Université Paris Saclay, France)
Caroline Pénicaud (GMPA, INRA AgroParisTech , Université Paris Saclay, France)
Stéphanie Passot (GMPA, INRA AgroParisTech , Université Paris Saclay, France)
Fernanda Fonseca (GMPA, INRA AgroParisTech , Université Paris Saclay, France)
Yann Gohon (IJPB, INRA AgroParisTech CNRS, Université Paris Saclay, France)
Matthieu Réfrégiers (Soleil Synchrotron, France)
Eva Pereiro (ALBA Synchrotron, Spain)
Bertrand Cinquin (LBPA, CNRS ENS Paris Saclay, France)
Marine Froissard (IJPB, INRA AgroParisTech CNRS, Université Paris Saclay, France)

Imaging intracellular compartments, their dynamics and interactions in living cells, remains challenging. Using various lipid droplet (LD) protein markers, we revealed inter LD heterogeneity at single cell level, due to LD specific geolocalisation and enzymatic equipment. Even so, using tagged proteins or vital probes could modify the morphology and the smooth running of the organelles. Methods based on intrinsic fluorescence of molecules upon excitation by deep ultra violet (DUV) illumination are thus emerging for living cell imaging. We used DUV from synchrotron radiation to perform auto-fluorescence and transmittance imaging on single living yeast. The contrasted signals inside the cells revealed chemical heterogeneity at the subcellular level. Microscopy showed organelles with low auto-fluorescence after DUV illumination. We distinguished two populations, with high or low transmittance. The first population corresponded to vacuoles and the second to LDs. LDs appeared as heterogeneous well-organized structures with a low transmittance zone on the surface and a high transmittance core. We propose that the low transmittance ring and the high transmittance core correspond to ergosterol and triacylglycerol-containing structures, respectively. The conclusions we drawn using DUV imaging were confirmed by experiments performed using soft X ray imaging on cryofixed cells. Synchrotron label free imaging paves the way for efficient structural and dynamic studies of LDs and other organelles.