

# WIRMS 2015

8th International Workshop on  
Infrared Microscopy and Spectroscopy  
using Accelerator Based Sources

October 11-15, 2015

## Conference Program



**BROOKHAVEN**  
NATIONAL LABORATORY

# Conference Agenda

Sunday, October 11	Monday, October 12	Tuesday, October 13
	<p>8:50 Welcome Larry Carr, Lisa Miller, John Hill, NSLS-II</p> <p><b>Facility Development</b> Paul Dumas, Synchrotron Soleil (Session Chair)</p> <p>9:10 Gwyn Williams Thomas Jefferson National Accelerator Facility</p> <p>9:40 Thierry Moreno Synchrotron Soleil</p> <p>10:00 Ibraheem Yousef ALBA Synchrotron</p> <p>10:20 Ferenc Borondics Synchrotron Soleil</p> <p style="text-align: center;"><i>10:40 Break</i></p> <p><b>Infrared Microspectroscopy and Imaging I</b> Michael Martin, ALS, Lawrence Berkeley Lab (Session Chair)</p> <p>11:10 Rohit Bhargava University of Illinois</p> <p>11:40 Paul Gelfand Stony Brook University</p> <p>12:00 Ebrahim Aboulizadeh University of Wisconsin-Milwaukee</p> <p style="text-align: center;"><i>12:20 Lunch</i></p> <p><b>Infrared Microspectroscopy and Imaging II</b> Lisa Miller, NSLS-II, BNL (Session Chair)</p> <p>1:30 Mark Tobin Australian Synchrotron</p> <p>2:00 Lisa Vaccari Elettra - Sincrotrone Trieste</p> <p>2:20 Immaculada Martinez-Rovira CNRS</p> <p>2:40 Ian Burgess Canadian Light Source</p> <p>3:00 Elisa Mitri Elettra - Sincrotrone Trieste</p> <p style="text-align: center;"><i>3:20 Break</i></p> <p><b>Infrared Microspectroscopy and Imaging III</b> Mark Tobin, Australian Synchrotron (Session Chair)</p> <p>3:50 Michael Martin Advanced Light Source, LBNL</p> <p>4:20 Kevin Louterback Lawrence Berkeley National Laboratory</p> <p>4:40 Giovanni Birarda Elettra - Sincrotrone Trieste</p> <p>5:00 Per Uvdal MAX-IV Laboratory, Lund University</p> <p style="text-align: center;"><i>5:20 Free Time</i></p> <p style="text-align: center;"><i>5:30 Poster Session</i></p> <p style="text-align: center;"><i>7:00 - 9:00 Dinner</i></p>	<p><b>Materials Under Extreme Conditions I</b> Thomas Timusk, McMaster University (Session Chair)</p> <p>9:00 Rus Hemley Carnegie Institute of Washington</p> <p>9:40 Shin-ichi Kimura Osaka University</p> <p>10:00 Janice Musfeldt University of Tennessee</p> <p>10:20 Hidekazu Okamura Tokoshima University</p> <p style="text-align: center;"><i>10:40 Break</i></p> <p><b>Materials Under Extreme Conditions II</b> Jan Musfeldt, University of Tennessee (Session Chair)</p> <p>11:10 Xiaoxiang Xi Pennsylvania State University</p> <p>11:40 Zhenxian Liu Carnegie Institution for Science</p> <p>12:00 Ulrich Schade BESSY, Helmholtz Zentrum</p> <p style="text-align: center;"><i>12:20 Lunch</i></p> <p><b>Condensed Matter and Time-Resolved Spectro.</b> Andrea Perucchi, Elettra (Session Chair)</p> <p>1:30 Paola Di Pietro INSTM Udr Trieste-ST</p> <p>1:50 Taras Stanislavchuk New Jersey Institute of Technology</p> <p>2:10 Yue Cao Brookhaven National Laboratory</p> <p>2:30 Mircea Cotlett CFN, Brookhaven National Laboratory</p> <p style="text-align: center;"><i>2:50 Free Time</i></p> <p style="text-align: center;"><i>3:00 Excursion</i></p> <p style="text-align: center;"><i>5:20 Free Time</i></p> <p style="text-align: center;"><i>5:30 Poster Session</i></p> <p style="text-align: center;"><i>7:00 - 9:00 Dinner</i></p>
4:00 - 7:00 Registration		
7:30 - 9:30 Reception		

Wednesday, October 14	Thursday, October 15	Session Title
		Plenary Lecture
<b>Near-Field Infrared I</b> Larry Carr, NSLS-II (Session Chair)	<b>Spectroscopy</b> Ulrich Schade, BESSY (Session Chair)	Invited Talk
9:00 Markus Raschke University of Colorado	9:00 Sergey Shilov Bruker Optics	
9:40 Peter Hermann Physikalisch-Technische Bundesanstalt (PTB)	9:20 Ruth Plathe Australian Synchrotron	
10:00 Robert Johns University of California, Berkeley	9:40 Mark Frogley Diamond Light Source	
10:20 Yuka Ikemoto SPRING-8	10:00 Scott Rosendahl Canadian Light Source	
10:40 Break	10:20 Larry Carr NSLS-II, Brookhaven National Laboratory	
<b>Near-Field Infrared II</b> Tim May, Canadian Light Source (Session Chair)	11:10 Open Forum	
11:10 Hans Bechtel Advanced Light Source, LBNL	Discussion on Infrared and THZ with Next Diffraction-Limited Synchrotron Light Sources	
11:40 Eric Mueller University of Colorado, Boulder	11:40 Closing Comments Paul Dumas, Synchrotron Soleil	
12:00 Raul Freitas LNLS	12:00 Box lunch <i>buses to NSLS-II and CFN Tours</i>	
12:20 Lunch	12:50 NSLS-II and CFN Tours	
<b>Near-Field Infrared III</b> Raul Freitas, Brazilian Synchrotron (Session Chair)		
1:30 Gianfelice Cinque Diamond Light Source		
1:50 Curtis Marcott Light-Light Solutions		
2:10 Michele Siggel-King Liverpool University and Daresbury Lab.		
<b>Sponsors Presentations</b>		
2:30 Neaspec - Andreas Hubers		
2:45 Anasys - Craig Prater		
3:00 Open Forum		
Detectors and Other Issues for Broadbent, Near-Field Infrared Spectroscopy and Imaging		
3:40 Break	3:30 Bus to LIRR, Ronkonkoma	
<b>Coherent THz and Ultrafast</b> Yves-Laurent Mathis, ANKA, KIT (Session Chair)	3:30 Bus back to Hyatt, Riverhead	
4:10 Juliane Raasch Karlsruhe Institute of Technology		
4:40 Andrea Perucchi TeraFermi, Sincrotrone Trieste		
5:00 Shigeru Kashiwagi Res. Ctr. for Electron Photon Sci., Tohoku U.		
5:20 - 6:15 Free Time		
5:30 International Advisory Board Meeting		
7:00 - 9:00 Banquet		
7:45 Dinner Talk <i>Shin-ichi Kimura   Osaka</i>		

# Thank you to our Sponsors

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## National Synchrotron Light Source II



# Program

## Sunday, 11 October 2015

- 4:00 pm      Registration in the Hyatt Hotel Lobby  
to 7:00 pm
- 7:30 pm      Reception – Hyatt / Riverside Pavilion  
to 9:30 pm      (behind Hyatt and Atlantis Aquarium, walk around west end of Atlantis)

*All Oral Sessions will take place in the Sea Star Conference Room  
(2<sup>nd</sup> floor, between Hyatt and Atlantis)*

## Monday, 12 October 2015

- 8:50 am      Welcome Remarks    Larry Carr and Lisa Miller (co-organizers)  
John Hill (NSLS-II Director and BNL Deputy Assoc. Lab. Dir.)

### Facility Development

*Session Chair: Paul Dumas, Synchrotron Soleil*

- 9:10 am      “U4IR and NSLS: End of an Era - Seeds for the Future” - INVITED  
Gwyn Williams, *T. Jefferson Nat’l Accel. Facility, Newport News, VA USA*
- 9:40 am      “Synchrotron Infrared Beamline Design”  
Thierry Moreno, *Synchrotron Soleil, St. Aubains, France*
- 10:00 am      “MIRAS: The Infrared Synchrotron Radiation Beamline at the Third Generation  
Light Source ALBA”  
Ibraheem Yousef, *ALBA Synchrotron, Barcelona, Spain*
- 10:20 am      “SMIS 2.0 – Future Perspectives”  
Ferenc Borondics, *Synchrotron Soleil, St. Aubains, France*
- 10:40 am      BREAK

### *Infrared Microspectroscopy and Imaging I*

Session Chair: Michael Martin, ALS, Lawrence Berkeley Nat'l Lab

- 11:10 am “Infrared Spectroscopic Imaging for Biomedical Applications – Emerging Opportunities and Challenges” - INVITED  
Rohit Bhargava, *University of Illinois, Urbana-Champaign, IL, USA*
- 11:40 am “FTIR Imaging of Copper Zinc Superoxide Dismutase Aggregation in Living Cells for the Study of Familial ALS”  
Paul Gelfand, *Stony Brook University, Stony Brook, NY, USA*
- 12:00 pm “Synchrotron Wide-field FTIR Imaging of Diabetic Retina Tissue”  
Ebrahim Aboualizadeh, *University of Wisconsin - Milwaukee, Milwaukee, WI, USA*
- 12:20 pm LUNCH - Dining area adjacent to Main Meeting room

### *Infrared Microspectroscopy and Imaging II*

Session Chair: Lisa Miller, NSLS-II, Brookhaven Nat'l Lab

- 1:30 pm “Single Contact ATR Mapping of Soft Materials by Synchrotron FTIR” - INVITED  
Mark Tobin, *Australian Synchrotron, Melbourne, VIC Australia*
- 2:00 pm “Soft X-Ray Microscopy Radiation Damage on Fixed Cells Investigated with Synchrotron Radiation FTIR Microscopy”  
Lisa Vaccari, *Elettra – Sincrotrone Trieste, Trieste, Italy*
- 2:20 pm “FTIR Study of the Biochemical Effects in F98 Glioma Cells Induced by X-ray Irradiations Combined with Gd Nanoparticles: First Studies at the Infrared EMIRA Beamline of SESAME Synchrotron (Jordan)”  
Immaculada Martínez-Rovira, *Centre National de la Recherche Scientifique (CNRS), France*
- 2:40 pm “SpectroElectrochemistry using Synchrotron Infrared Radiation”  
Ian Burgess, *Canadian Light Source, Saskatoon, Saskatchewan, Canada*
- 3:00 pm “Dynamic of the Heat-Shock Response in Live Cells followed by FTIR Microspectroscopy”  
Elisa Mitri, *Elettra – Sincrotrone Trieste, Trieste, Italy*
- 3:20 pm BREAK

### *Infrared Microspectroscopy and Imaging III*

Session Chair: *Mark Tobin, Australian Synchrotron*

- 3:50 pm “Infrared Spectroscopy in 3D: FTIR Spectro-Microtomography” - INVITED  
Michael Martin, *Advanced Light Source, LBNL, Berkeley, CA USA*
- 4:20 pm “Open Channel Microfluidic Membrane Device for Long-term FTIR Spectromicroscopy of Live Adherent Cells”  
Kevin Louterback, *Lawrence Berkeley National Laboratory, Berkeley, CA USA*
- 4:40 pm “SR-FTIR Technology for Archaeal/Bacterial Identification and Functional Profiling”  
Giovanni Birarda, *Elettra – Sincrotrone Trieste, Trieste, Italy*
- 5:00 pm “Molecules as Documents of the Past: Were Dinosaurs Really Black?”  
Per Uvdal, *MAX Lab, Lund, Sweden*
- 5:20 pm FREE TIME
- 5:30 pm POSTER SESSION - Upstairs Front Room (adjacent to main stairway and foyer)
- 7:00 pm DINNER - Dining area adjacent to Main Meeting room  
to 9:00 pm

**Tuesday, 13 October 2015**

### *Materials Under Extreme Conditions I*

Session Chair: *Thomas Timusk, McMaster University*

- 9:00 am “New Light on Materials in Extreme Conditions” - PLENARY INVITED  
Rus Hemley, *Carnegie Institution for Science, Washington, DC USA*
- 9:40 am “Spatial Distribution of the Carrier Density in Yttrium-Doped SMS”  
Shin-ichi Kimura, *Osaka University, Osaka, Japan*
- 10:00 am “Revealing the Pressure-Induced Breakdown Pathway in WS<sub>2</sub> Nanotubes”  
Janice Musfeldt, *University of Tennessee, Knoxville, TN USA*
- 10:20 am “Pressure Evolution of an Excitonic Insulator Studied by Synchrotron Infrared Spectroscopy”  
Hidekazu Okamura, *Tokushima University, Tokushima, Japan*
- 10:40 am BREAK

## Materials Under Extreme Conditions II

Session Chair: Jan Musfeldt, *University of Tennessee*

- 11:10 am “Infrared Signatures of Pressure-Induced Topological Phase Transitions in Selected Narrow-Gap Semiconductors” - INVITED  
Xiaoxiang Xi, *the Pennsylvania State University, State College, PA USA*
- 11:40 am “Synchrotron Infrared and Raman Spectroscopic Studies of Dense Solid Hydrogen”  
Zhenxian Liu, *Carnegie Institution for Science, Washington, DC USA*
- 12:00 pm “Commissioning of a Single-Shot Mid-Infrared Spectrometer”  
Ulrich Schade, *BESSY, Helmholtz Zentrum, Berlin, Germany*
- 12:20 pm LUNCH - Dining area adjacent to Main Meeting room

## Condensed Matter and Time-Resolved Spectroscopies

Session Chair: Andrea Perucchi, *TeraFermi@Elettra*

- 1:30 pm “Spectral weight redistribution in  $(\text{LaNiO}_3)_n/(\text{LaMnO}_3)_2$  Superlattices from Optical Spectroscopy”  
Paola DiPietro, *INSTM Udr Trieste-ST, Trieste, Italy*
- 1:50 pm “Mueller Matrix Spectroscopic Ellipsometry of Magnons and Magneto-Electric Modes in Multiferroics using Synchrotron Radiation”  
Taras Stanislavchuk, *New Jersey Institute of Technology, Newark, NJ USA*
- 2:10 pm “Ultrafast Snapshots of Magnetic Correlations in Photo-Doped Mott Insulator  $\text{Sr}_2\text{IrO}_4$ ”  
Yue Cao, *Brookhaven National Laboratory, Upton, NY USA*
- 2:30 pm “Time-Resolved Single Nanocrystal Micro Photoluminescence Studies of 0d and 0d-2d Semiconducting Nanomaterials”  
Mircea Cotlett, *Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, NY USA*
- 2:50 pm FREE TIME
- 3:00 pm EXCURSION - Visit to Jason's Vineyard for Long Island Wine Tasting
- 5:20 pm FREE TIME
- 5:30 pm POSTER SESSION - Upstairs Terrace Room (adjacent to main stairway)
- 7:00 pm DINNER – Riverfront Room  
to 9:00 pm

Wednesday, 14 October 2015

Near-Field Infrared I

Session Chair: Larry Carr, *NSLS-II, Brookhaven Nat'l Lab*

- 9:00 am “Synchrotron Infrared Nano-Spectroscopy and -Imaging” - PLENARY INVITED  
Marcus Raschke, *University of Colorado, Boulder, CO USA*
- 9:40 am “Adaption of Broadband Synchrotron Radiation for Nano-FTIR Spectroscopy”  
Peter Hermann, *Physikalisch-Technische Bundesanstalt (PTB), Berlin, Germany*
- 10:00 am “Single Plasmonic Metal Oxide Nanocrystal Characterization Utilizing Synchrotron Infrared Nanoscopy”  
Robert Johns, *University of California, Berkeley CA and Texas A&M University, College Station, TX USA*
- 10:20 am “Infrared Near-Field Spectroscopy System at SPRing-8 BL43IR”  
Yuka Ikemoto, *SPRing-8, Harima, Japan*
- 10:40 am BREAK

Near-Field Infrared II

Session Chair: Tim May, *Canadian Light Source*

- 11:10 am “Nanospectral Imaging of Phonon Polaritons with SINS” - INVITED  
Hans Bechtel, *Advanced Light Source, LBNL, Berkeley, CA USA*
- 11:40 am “Synchrotron Infrared Near-Field Spectroscopy of Antenna-Coupled Molecular Vibrations”  
Eric Mueller, *University of Colorado, Boulder, CO USA*
- 12:00 pm “Synchrotron Infrared Nano-Spectroscopy by Self-Referenced Interferometry”  
Raul Freitas, *LNLS*
- 12:20 pm LUNCH - Dining area adjacent to Main Meeting room

Near-Field Infrared III

Session Chair: Raul Freitas, *Brazilian Synchrotron Light Laboratory*

- 1:30 pm “Near-Field IR Spectromicroscopy using Photothermal Probes and Broadband Synchrotron Radiation at Diamond”  
Gianfelice Cinque, *Diamond Light Source, Didcot-Harwell, OX UK*

- 1:50 pm “AFM-Based Nanoscale Infrared Spectroscopy of Monolayers and Ultra-Thin Films”  
Curtis Marcott, *Light-Light Solutions*
- 2:10 pm “Development of Cancer Diagnostics using the Alice IR-FEL for IR-SNOM and AFM-IR Imaging of Tissue”  
Michele Siggel-King, *Liverpool University and Daresbury Laboratory, UK*
- 2:30 pm Sponsor Presentation – **NeaSpec**  
Andreas Hubers
- 2:45 pm Sponsor Presentation – **Anasys**  
Craig Prater
- 3:00 pm *Open Forum* – Discussion on Detectors and Other Issues for Broadband, Near-Field Infrared Spectroscopy and Imaging
- 3:40 pm BREAK

### *Coherent THz and Ultrafast*

Session Chair: **Yves-Laurent Mathis**, *ANKA, KIT*

- 4:10 pm “Single-shot Terahertz Spectroscopy with Picosecond Time Resolution” - INVITED  
Juliana Raasch, *Karlsruhe Institute of Technology, Karlsruhe, Germany*
- 4:40 pm “TeraFermi Beamline: Final Project and Status of the Installation”  
Andrea Perucchi, *TeraFermi, Sincrotrone Trieste, Basso Villa, Italy*
- 5:00 pm “Extremely Short Electron Bunch Generation for Producing THz Superradiance at T-ACTS, Tohoku University”  
Shigeru Kashiwagi, *Research Center for Electron Photon Science, Tohoku University, Sendai, Japan*
- 5:20 pm FREE TIME
- 5:30 pm International Advisory Board Meeting - Main Conference Room
- 7:00 pm CONFERENCE BANQUET – Atlantis Aquarium  
to 9:00 pm Banquet Keynote Speaker – Shin-Ichi Kimura, *Osaka University*

Thursday, 15 October 2015

Spectroscopy

Session Chair: Ulrich Schade, *BESSY, Helmholtz Zentrum*

- 9:00 am “Rapid-Scan, Step-Scan, and Interleaved Time-Resolved Spectroscopy - Signal-to-Noise Comparison”  
Sergey Shilov, *Bruker Optics, Billerica, MA USA*
- 9:20 am “Laser Photolysis on the THz Beamline at the Australian Synchrotron”  
Ruth Plathe, *Australian Synchrotron, Melbourne VIC Australia*
- 9:40 am “Synchrotron Infrared Studies of Metal-Organic Frameworks at Diamond Light Source”  
Mark Frogley, *Diamond Light Source, Didcot-Harwell, OX UK*
- 10:00 am “Aspects of Designing and Building Plasmonic Nanostructured Devices for use in Synchrotron Infrared Spectromicroscopy”  
Scott Rosendahl, *Canadian Light Source, Saskatoon, Saskatchewan, Canada*
- 10:20 am “Plasmonic and Effective Medium Behavior of Nanoscopic Granular Gold Films”  
Larry Carr, *NSLS-II, Brookhaven National Laboratory, Upton NY USA*
- 10:40 am BREAK
- 11:10 am *Open Forum* – Discussion on Infrared and THz with Next Generation Diffraction-Limited Synchrotron Light Sources
- 11:40 am Closing Remarks  
Paul Dumas, *Synchrotron Soleil, Saint Aubains, France*
- 12:00 pm Box Lunch and Buses to Brookhaven National Laboratory for NSLS-II and CFN Tours
- 12:50 pm NSLS-II and Center for Functional Nanomaterials Tours
- 3:30 pm Bus departs from NSLS-II to Long Island Railroad (LIRR) Ronkonkoma station  
Bus departs for Hyatt Place Hotel (Riverhead)

