

# Emergency Information



## Fire

- Evacuate. Be aware of building exits.
- Follow building residents to the assembly area.
- Do not leave until you are accounted for, and have been instructed to.

## Earthquake

- Remain in building: duck, cover, and hold position.
- When shaking stops: evacuate building via a safe route to the assembly area.
- Do not leave until you are accounted for, and have been instructed to do so.



# FACET-II

Facility for Advanced Accelerator Experimental Tests

## FACET-II Science Workshop: Introduction and Why we are here

FACET-II Science Workshop October 17-20, 2017

Mark J. Hogan  
FACET-II Project Scientist



U.S. DEPARTMENT OF  
**ENERGY**  
Office of Science



**SLAC** NATIONAL  
ACCELERATOR  
LABORATORY

# FACET-II Science Opportunities Workshops




## FACET-II Science Workshop 2017

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- QUICK LINKS
- Registration
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  - FACET-II CDR
  - FACET-II TDR
  - 2016 Science Workshop
  - 2016 Workshop Report
  - 2015 Science Workshop
  - 2015 Workshop Report

ACCOMMODATIONS



If you wish to reserve a room at the Stanford Guest House, please contact the Stanford Guest House directly at **(650) 926-2800** or reserve room via their **online booking system**.

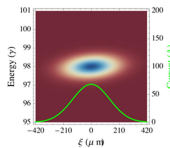
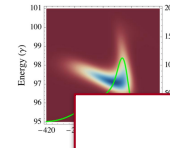
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- Princeton
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- The University of Chicago
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- University of Oslo
- UPenn



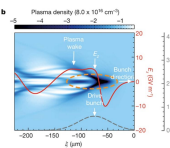
59 People  
22 Institutions

SLAC-R-1063

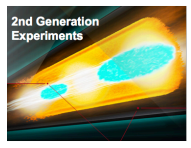
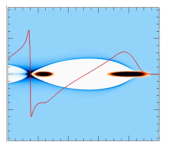
**FACET-II Science Opportunities Summary Report**  
October 12-16, 2015  
Editor: Nan Phinney  
Publication Date: March, 2016

SLAC National Accelerator Laboratory  
2575 Sand Hill Road  
Menlo Park, CA, 94022



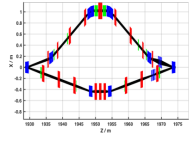
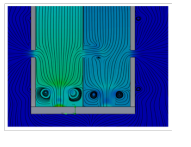
This material is based upon work supported by the U.S. Department of Energy, Office of Basic Energy Sciences, under Contract No. DE-AC02-76SF0165.

SLAC-R-1078

**FACET-II Science Workshop Summary Report**  
October 17-19, 2016  
Editors: Mark J. Hogan and Nan Phinney  
Publication Date: May 2017

SLAC National Accelerator Laboratory  
2575 Sand Hill Road  
Menlo Park, CA 94025

This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Basic Energy Sciences, under Contract No. DE-AC02-76SF00515 and HEP.

2017 is the 3<sup>rd</sup> FACET-II Workshop

# Agenda & Session Topics

Tuesday

Wednesday

Thursday

Friday

Start Time	Session Topic	Presentation	Presenter	Affiliation
09:00 am	Overview	Workshop Introduction	Mark Hogan	SLAC
09:15 am	Overview	FACET-II Project Update	Vitaly Yakimenko	SLAC
09:45 am	Overview	FACET-II Capabilities: e-, e+, two-bunches, sailboat: extreme peak current, non-neutral fireballs etc	Glen White	SLAC
10:30 am		<b>Coffee Break</b>		
11:00 am	Overview	High Level Summary of Anticipated Experimental Program @ FACET-II	Mark Hogan	SLAC
11:30 am	Emittance preservation & pump depletion	Energy doubling with emittance preservation and pump depletion	Chan Joshi	UCLA
12:15 pm		<b>Lunch</b>		
01:15 pm	Emittance preservation & pump depletion	Plasma sources with density ramps (Li oven + apertured controlled gas pressure)	Ken Marsh	UCLA
01:45 pm	Emittance preservation & pump depletion	Differential pumping: IP integration & performance	Christine Clarke	SLAC
02:15 pm	Emittance preservation & pump depletion	Plasma source with optically generated density ramps	Mike Litos	UC Boulder
02:45 pm	Emittance preservation & pump depletion	Emittance measurements: Butterfly technique and implications for spectrometer	Brendan O'Shea	SLAC
03:15 pm		<b>Coffee Break</b>		
03:30 pm	Emittance preservation & pump depletion	FACET-II diagnostics overview	Nate Lipkowitz	SLAC
04:00 pm	Emittance preservation & pump depletion	Novel diagnostics and beam phase space recovery	Claudio Emma	SLAC
04:30 pm	Emittance preservation & pump depletion	Expected beam performance with stability analysis	Glen White	SLAC
05:00 pm	Emittance preservation & pump depletion	Benefits of a zig-zag compression design for FACET-II	Yichao Jing	BNL
05:30 pm	Emittance preservation & pump depletion	Discussion		
06:00 pm		<b>Adjourn</b>		

# Agenda & Session Topics

<span>Tuesday</span> <span>Wednesday</span> <span>Thursday</span> <span>Friday</span>				
Start Time	Session Topic	Presentation	Presenter	Affiliation
09:00 am	Transverse Wakefields with strong beam loading	Emittance vs Loading (introduction, theory with high level simulation results)	Sergei Nageitsev	FNAL
09:30 am	Transverse Wakefields with strong beam loading	Detailed computational discussion and next steps in understanding emittance vs. loading in PWFA	Weiming An	UCLA
10:00 am	Transverse Wakefields with strong beam loading	Theoretical progress (multi-modal analysis)	Xinlu Xu	UCLA/SLAC
10:30 am		<b>Coffee Break</b>		
11:00 am	Transverse Wakefields with strong beam loading	Lessons learned from FACET and path forward for FACET-II experiment (offset knobs & what we will see on spectrometer)	Erik Adli	U. Oslo
11:30 am	Transverse Wakefields with strong beam loading	Diagnostic requirements for witness bunch offsets ( $r, z$ )	Mike Litos	UC Boulder
12:00 pm	Transverse Wakefields with strong beam loading	Cascaded High-Transformer Ratio PWFA	Wei Lu	Tsinghua University
12:30 pm		<b>Lunch</b>		
01:30 pm	Positrons, hollow channels and dielectrics	Hollow channel longitudinal & transverse wakes	Carl Andreas Lindstrom	University of Oslo
02:00 pm	Positrons, hollow channels and dielectrics	Dielectric Wakefield Accelerators: status & what's next	Gerard Andonian	UCLA
02:30 pm	Positrons, hollow channels and dielectrics	Analysis of BBU in compact structure-based wakefield accelerators and a suppression method	Stanislav Baturin	University of Chicago
03:00 pm	Positrons, hollow channels and dielectrics	Saturation of the beam-hosing instability in quasi-linear plasma-wakefield accelerators	Remi Lehe	LBNL
03:30 pm		<b>Coffee Break</b>		
03:45 pm	Positrons, hollow channels and dielectrics	Positron PWFA - what we've learned and what's next	Sebastien Corde	Ecole Polytechnique
04:15 pm	Positrons, hollow channels and dielectrics	Electron Driven Positron Acceleration with the Sailboat Chicane	Weiming An	UCLA
04:45 pm	Positrons, hollow channels and dielectrics	Non-neutral fireball and possibilities for accelerating positrons with plasma	Jorge Viera	IST
05:15 pm	Positrons, hollow channels and dielectrics	Discussion		
06:00 pm		<b>Adjourn</b>		

# Agenda & Session Topics



Tuesday

Wednesday

Thursday

Friday

Start Time	Session Topic	Presentation	Presenter	Affiliation
09:00 am	Injection experiments	Ionization injection - what we've learned and next steps	Navid Vafaei	Stonybrook University
09:30 am	Injection experiments	Density Downramp Injection - Prospects for Ultra-high Brightness Beams	Xinlu Xu	UCLA/SLAC
10:00 am	Injection experiments	Trojan Horse and Plasma Torch Injection - lessons learned and next steps	Bernhard Hidding	University of Strathclyde
10:30 am		<b>Coffee Break</b>		
11:00 am	Injection experiments	Plans @ DESY	Jens Osterhoff	DESY
11:30 am	Injection experiments	Low emittance measurements:100nm from betatron spectrum	Nathan Majernik	UCLA
12:00 pm	Plasma Accelerator based FELs	Status of task force efforts	Mark Hogan	SLAC
12:30 pm		<b>Lunch</b>		
01:30 pm	Plasma Accelerator based FELs	Realizing an FEL from a Plasma Accelerator - Progress and Plans at LBNL	Jeroen VanTillborg	LBNL
02:00 pm	Ion Motion	Ion motion effects on emittance	Weiming An	UCLA
02:30 pm	Ion Motion	Ion motion effects on energy spread	Xinlu Xu	UCLA/SLAC
03:00 pm		<b>Coffee Break</b>		
03:15 pm	Ion Motion	Emittance preservation in plasma-based accelerators with ion motion	Carlo Benedetti	LBNL
03:45 pm	Ion Motion	Long term wake evolution: heating & ion wakes	Jorge Viera	IST
04:15 pm	Ion Motion	Imaging of beam-induced plasma structures: FACET and FACET-II	Mike Downer	UT Austin
04:45 pm	Ion Motion	TeV/m in Plasmas	James Rosenzweig	UCLA
05:15 pm	Ion Motion	Discussions		
05:30 pm		<b>Adjourn</b>		

# Agenda & Session Topics



Tuesday Wednesday Thursday **Friday**

Start Time	Session Topic	Presentation	Presenter	Affiliation
09:00 am	Simulation Codes	QuickPIC	Weiming An	UCLA
09:30 am	Simulation Codes	OSIRIS	Warren Mori	UCLA
10:00 am	Simulation Codes	WarpX & Exascale	Jean LucVay	LBNL
10:30 am		<b>Coffee Break</b>		
11:00 am	Simulation Codes	VSIM	John Cary	UC Boulder & TechX
11:30 am	Simulation Codes	8 Years of Beam-Driven Wakefield Simulation -- lessons learned, reduced models, and future plans	David Bruhwiler	Radiasoft
12:00 pm	New Directions @ FACET-II	Active plasma lenses – limitations on beam energy/density and aberrations	Jan-Hendrik Röckeman	DESY
12:30 pm		<b>Lunch</b>		
01:30 pm	New Directions @ FACET-II	High Field QED enabled by 100TW + 15GeV	David Reis	SLAC
02:00 pm	New Directions @ FACET-II	High Fields: compressed 10GeV+300MeV—> 100GeV/100GeV	Sebastian Meuren	Princeton University
02:30 pm	New Directions @ FACET-II	High Fields: computational challenges	Thomas Grismayer	IST
03:00 pm		<b>Coffee Break</b>		
03:15 pm	New Directions @ FACET-II	Laser upgrade options: >100TW, transport and quality improvement	Alan Fry	SLAC
03:45 pm	New Directions @ FACET-II	Laboratory Astrophysics studies with electron-positron beams at FACET-II	Frederico Fiuza	SLAC
04:15 pm	New Directions @ FACET-II	Material studies with compressed electron & positron beams at FACET-II	Ioan Tudosa	University of Pennsylvania
04:45 pm	New Directions @ FACET-II	Discussions		
05:15 pm		<b>Adjourn</b>		

## Following the Workshop

- Will be reporting the outcome to DOE in early November
  - We need your help and all slides posted so that we can help you
- Next workshop Fall 2018 commensurate with call for proposals
- Development of individual high profile FACET-II experiments is coordinated through numerous collaborations meetings
- The call for proposals is expected after the project is baselined and will be followed by the first FACET-II external advisory committee meeting (expected in FY18)

The purpose of this workshop is to understand what improvements are needed at the facility to support the next generation of experiments



## All Work and No Play...

In addition to the full science agenda, we have a couple other options for collaboration development

- Tuesday evening
  - @ The Dutch Goose
  - 3567 Alameda de Las Pulgas, Menlo Park, CA 94025
- Thursday evening
  - Reception courtesy of SLAC Management
  - Lobby of Building 53



## One more thing...

Dear Stanford Faculty & Staff,

On Thursday, October 19, between noon-12:30 pm, Stanford University will conduct its **annual test of the campus AlertSU system**. Alert messages will be sent via text message and email to the Stanford community.

The test will also include activation of the outdoor warning system, which will sound an audible tone for approximately 60 seconds followed by a verbal message from each of the 7 sirens at various campus locations. The sirens will be audible throughout the campus and may also be heard in parts of the surrounding communities including Palo Alto, Menlo Park and Los Altos.

Also being tested is the Cisco VoIP speaker phones. VoIP speaker phones are found in many of the academic and office buildings throughout campus. If you have a Cisco phone in your area, the alerts message will broadcast from the speaker phone and a banner message will appear in the display...

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