



LCLS SAC Meeting
September 13-14, 2007

DRAFT report NOT YET VETTED BY SAC

Members

Roger Falcone - UC Berkeley, USA, Chair
Phil Bucksbaum - Stanford University, USA
Robert L. Byer - Stanford University, USA
Hans Frauenfelder - LANL, USA
* Wayne Hendrickson - Columbia University, USA
Tetsuya Ishikawa - RIKEN Spring-8 Center, Japan
* Margaret Murnane - University of Colorado-Boulder, USA
Jochen R. Schneider - HASYLAB, Germany
Francesco Sette - ESRF, France
* Sunil Sinha - UCSD, USA
Dietrich von der Linde - University of Essen, Germany
* Justin Wark - Oxford University, USA
C. Lewis Cocke - Kansas State University, USA
Robert Schoenlein - LBNL, USA
Philip Anfinrud - NIH, USA
* Geraldine Richmond - University of Oregon, USA

* Excused



Agenda

LCLS Scientific Advisory Committee Meeting
Agenda
Thursday September 13, 2007 – Friday September 14, 2007

Thursday – September 13, 2007

SSRL BLDG 137 3rd floor Conference Room (322)

08:00	<i>Continental Breakfast/Welcome</i>	Persis Drell
08:30	Welcome	Keith Hodgson
08:45	LCLS Update	John Galayda
09:30	LCLS near term options (2 nd undulator-ESASE)	Jerome Hastings
10:00	<i>Break</i>	
10:30	CLOSED SESSION User access Policy	John Galayda
12:30	<i>Lunch-Lab update</i>	Keith Hodgson
01:30	Team leader reports (20 minutes each)	
03:30	<i>Break</i>	
04:00	LUSI update	Jerome Hastings
04:15	Instrument scientist reports	
05:30	Discussions with Instrument scientist and team leaders	
06:30	End	
07:00	<i>Dinner</i>	

Friday – September 14, 2007

SSRL BLDG 137 3rd floor Conference Room (322)

08:00	<i>Continental Breakfast</i>	
08:30	Discussion of broadening the LCLS user community	John Galayda
09:30	Executive Session	
12:00	<i>Lunch and Closeout</i>	

Report

The LCLS SAC met for 1.5 days. We focused on consideration of the science program, user access, and the status plans for the Teams and LUSI instruments.

1) Acting SLAC Director Drell asked us to “look forward,” and to advise on the following challenges:

- Initial LCLS operations and the transition to user operations
- Planning for phases beyond the initial experiments, including the case for new science beyond the initial experiments, and possible additional undulators

Photon Sciences Director Hodgson added particular concerns about the status of the HEDS program and the transition to operation and an open-access user facility

2) LCLS Director Galayda gave an update on the LCLS project. He noted that the following week he would present a rebaseline of the project to BES in light of cuts in FY07, that the project is 54% complete.

The SAC was pleased to hear that despite budget issues, the previous plan is going forward: commissioning of the FEL will begin with delivery of x-rays to the Near Hall in CY 2009, and that FY 2011 is planned to be a full year of operations. The SAC was also pleased to hear that the plan was to hire a leader for the science experiments (in the near term) and a leader for the user program. This leader should coordinate activities of the Team Leaders.

3) LUSI Director Hastings summarized a summary of some ideas being discussed by a Task Force for expansion of LCLS, including multiple bunches that could be multiplexed to additional undulators, ESASE, ultrashort pulses, seeding, wavelength extension to softer and harder x-rays, and some ideas for development of advanced accelerator technology at SLAC.

The SAC was impressed with the breadth of the wide-ranging discussions on potential augmentations of the LCLS technical capabilities for the future. However, we agree with the views expressed for the need for extensive engagement of potential users and the need for underpinning these discussions on possible machine upgrades with a science case. There is a need to realistically evaluate potential availability of resources, in both the shorter term (e.g., for ESASE) and longer-term options (e.g., possible SLAC strategic goals related to an FEL “farm”). At the upcoming Users’ Meeting, potential users should be exposed to these planning processes, in order to begin engaging them.

4) LCLS Director Galayda provided some current ideas for enabling user access at LCLS.

The SAC notes the importance of developing the fundamental principles that should drive the development of user access policies. We also note that there is considerable local expertise available, through personnel associated with SSRL, LUSI, and the former SPPS to craft these policies now.

While the SAC has no desire to itself craft the user access policy, we believe that the goals of LCLS management are consistent with what we consider to be the following fundamental principles:

- Goals of the user access policy include attracting a large number of diverse users and enabling a broad set of important research experiments that take advantage of the unique capabilities of the LCLS
- There should be a clear definition of the activities and time allocations for “commissioning” and “user operations” phases
- Leadership, membership, and operational principles of Instrument Teams should be defined (these will be dynamic entities)
- Team leaders are expected to promote and optimize science on their instruments
- Roles, responsibilities, and beneficial access to LCLS for the Teams should be defined
- It should be clear that the responsibility for demonstrating FEL and instrument operation rests with the LCLS Project
- Commissioning will be managed by Instrument Scientists, in collaboration with Teams
- There will be a Program Review Panel
- All proposed work must be peer-reviewed
- Proposals need to be made by all users
- There will be proposals by Teams, through Team Leaders
- There will be proposals by individuals
- There will be proposals by individuals or new Teams that include new instruments
- Memorandums of understanding between Teams and LCLS would clarify roles and responsibilities
- A date for receipt of proposals should be announced (possibly in mid 2008)
- Beamtime assignment done by LCLS in discussion with Instrument Scientists
- For major proposals (e.g., soft x-ray, HEDS) the review will be done by the SAC in consultation with LCLS (review will include feasibility of the program, staffing availability, general user access to instruments, permanence of an instrument or facility, data acquisition interface issues, etc.)
- Proposals should include requests for number of shifts over a period of one calendar year.
- It is anticipated that approximately 50% of total machine operation time will be available for all users. It is further anticipated that Teams will utilize about approximately 50% of that user time.

- Some allocation of time should be reserved for the discretionary use of the LCLS Director and for Instrument Scientists.
- Review processes need to be in place to evaluate long-term progress; that can be done by SAC and/or by reporting of results in future request for beamtime
- Attention will need to be given to appropriate balance of fields and use of instruments.
- There needs to be clarity regarding the availability and capability of instruments.
- Information should be made available on an updated LCLS website

5) Photon Sciences Director Hodgson provided an update on SLAC management and transition issues.

The SAC was pleased to hear that that LCLS will transition to a user facility parallel to SSRL in the SLAC organization, and that strategic planning for SLAC is proceeding with the specific needs of an evolving and wide-ranging x-ray free-electron laser program taken into account, including support programs in lasers, accelerators, computing, detectors, etc.

6) We heard from 4 Team Leaders on the status of their programs.

HEDS leader Lee noted that funding is not yet identified for the HEDS hutch or instrument, but attempts to find that funding are proceeding. A workshop was held to establish need among researchers at NNSA labs. SLAC is engaging with the Team and the UC multi-campus institute IMDEC, within the context of the SUCCEEDS memorandum of understanding between UC and Stanford, to approach LLNL, DOE NNSA, potential international partners, and various commercial firms. Activities in this area are proceeding at FLASH.

We encourage high level discussions among leadership at SLAC and LLNL to find a path forward, in order to at least keep the HEDS hutch on track with other hutches in the far hall, and at best to construct the multi-kJ laser. Growth of the Team, to include a broader community involved with high-pressure and high-temperature studies, is encouraged.

Pump-probe leader Gaffney presented a broad set of possible proposals for early work on that instrument.

We expect that the team will begin to focus on prioritization of experiments following their workshop at the joint SSRL/LCLS meeting in early October.

Atomic physics leader DiMauro also presented the plan for the AMO instrument.

expecting getting light at commissioning
Focus on high intensity

Question of connection to on-going work on FLASH
Hardware install Jan 09 slip to Spring 09?
AMOS science start by Fall 09 at end of commissioning
\$5M campus purchase long-lead procurements and reimburse?
All required optics and diagnostics by end of project 2010
First experiment = Neon near edge
Electron and ion energies

Coherent x-ray imaging leader Henry Chapman presented the status of current experiments at FLASH, and both a near and long term vision for the Team.

Well-defined team and program
Very ambitious
Work at FLASH and synchrotrons
Technical developments at other labs
Concern over integration of John Miao's nanoscience work
Organized, and governance seems to work well
Continuing technical needs to push capabilities
170 GW at 10 fs = could do atomic resolution
If had E11 photons in 100 nm spot, aligned target, short pulse = atomic resolution
3-5 Angstroms on large objects (reproducible objects); cryo EM will not work
Damage measurements so far agree with models

XPCS did not present

Anders Nilsson spoke for a group interested in soft x-ray physics, chemistry, and materials. He was uncertain over the status and access for his soft x-ray team

Soft x-ray scattering experiments in materials science
Can bring own instruments
Has held workshops; e.g., SLAC/DESY Workshop in May 07
XES better than PE, but could study beam mater interaction, space charge effects
Need to consider this as proto type for User Proposals
Use of two-pulse pump; Use of laser excitation
Community is anxious about getting time

We advise that a capability be enabled to accommodate soft x-ray material physics (like AMO, this is key to understanding fundamentals of FEL solid interaction) and other important programs and experiments not currently envisioned by the current Teams and Instruments program.

Closeout

The following closeout remarks were given to LCLS management at the end of the SAC meeting.

Our charge: How do initial operations of LCLS and transition to user operations
 Give advice on next phase, and a new science case
 Consider additional undulators and experiments
 Look forward

Our observations and recommendations:

1) Management structure

Concur with the stated need to rapidly hire head of science experiments, to coordinate Team Leaders and user processes; utilize local expertise now to craft policies.

2) Planning and development of a vision for facilities beyond initial LCLS

Need to realistically evaluate potential availability of resources, but we support the broad ranging discussions on scientific impact; engage broader national community; consideration of costs/impacts of both shorter term (ESASE) and longer term options (SLAC strategic) should be discussed

At Users' Meeting, expose users to planning processes, to begin engaging them.

3) Team Leaders

Observed that some Team Leaders are not clear on their role and responsibilities. Concerned over the readiness of Teams to prioritize experiments.

There is a lack of clarity on priorities and a path to establish scientific priorities, and specific first experiments.

A current list of Team Leaders, Instrument Scientists, and Team members should be developed

4) Instrument Scientists

Excellent clarity on instrument design

Need clear timeline on what is available, when, especially for Users' Meeting

5) Proposal Review and beamtime allocation

Need to appoint LCLS PRP and have clarity on principals for access, shift allocation, etc.

6) Preparation for Users' Meeting



Need clarity on role of Team Leaders, proposal application and review process, Collaborative Access Agreements, principles on beamtime allocation, timeline for instrument availability

7) Need to engage new users and identify new support for users, e.g. biologists

DOE/NSF/NIH should entertain proposals to do science on LCLS
Need to engage program managers

DRAFT