



SPEAR3 Accelerator Division All Hands Meeting

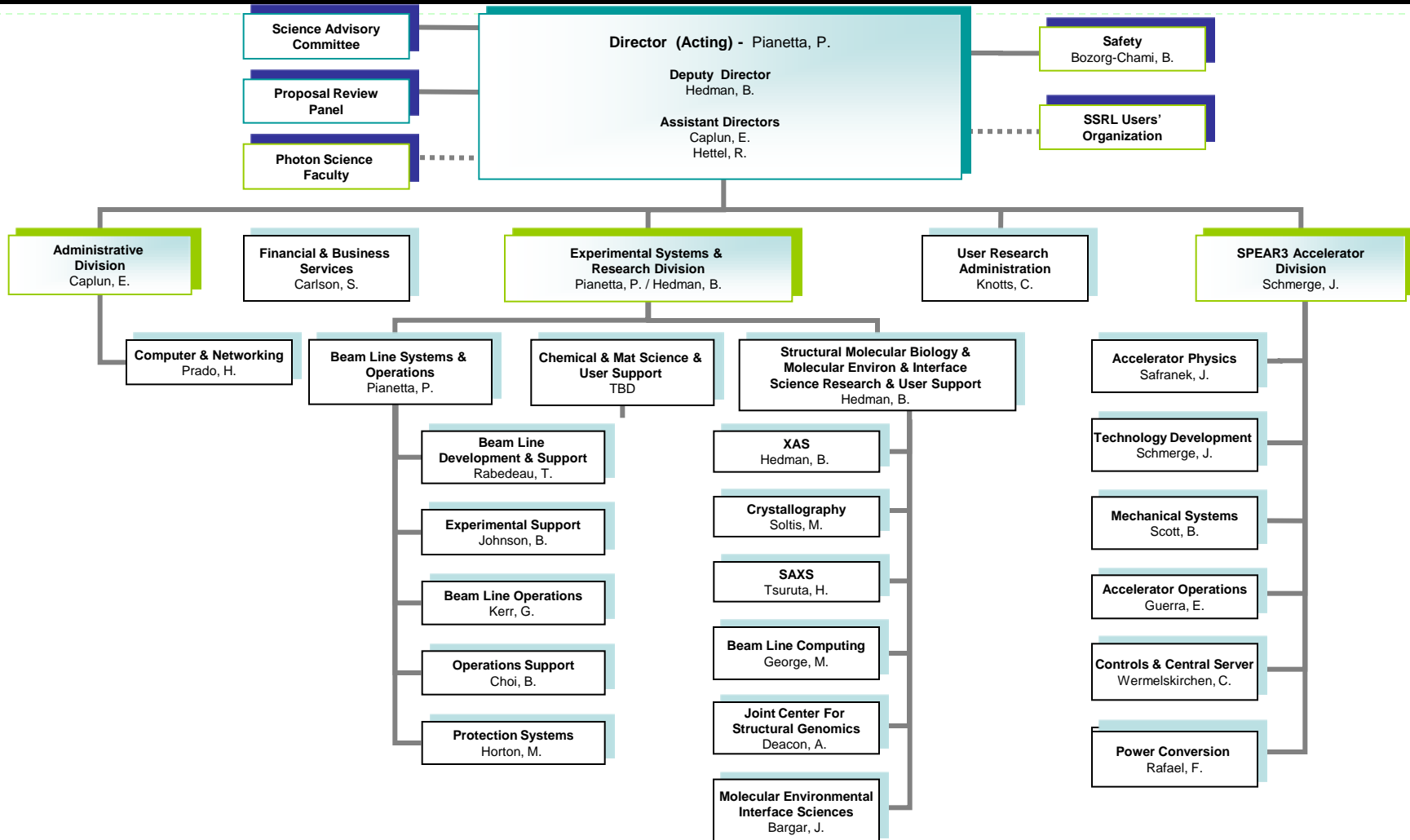
John Schmerge

Outline

- Organization
 - SSRL
 - AD
 - SPEAR3 Accelerator Division
 - Electrical Systems Support
 - Service Level Agreements
 - System Managers
- Safety
 - WPC
 - Recent Accidents
 - Lessons Learned
- Accelerator Projects
 - 0-1 year
 - 1-5 year
 - > 5 year



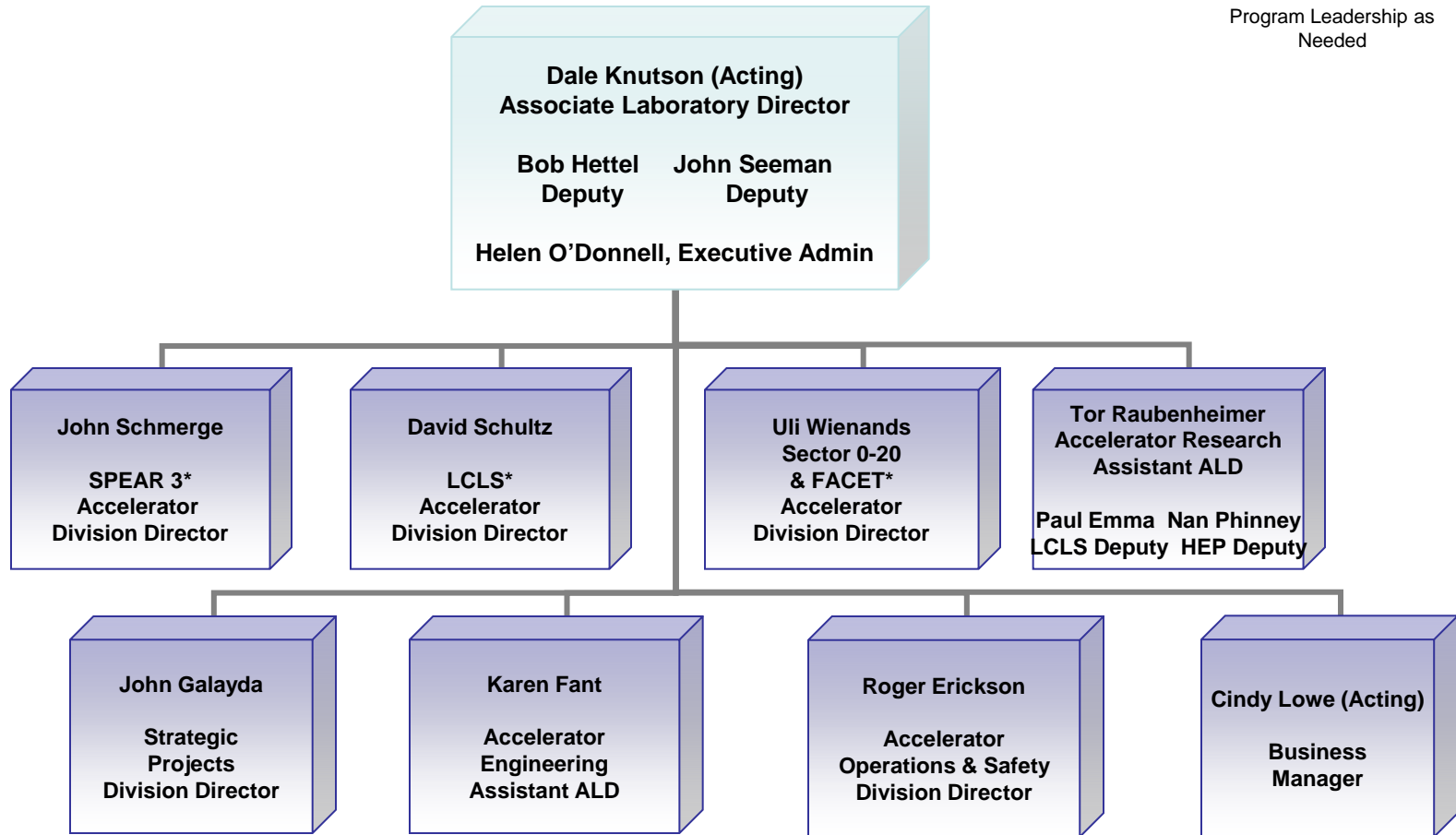
SSRL Organization Chart





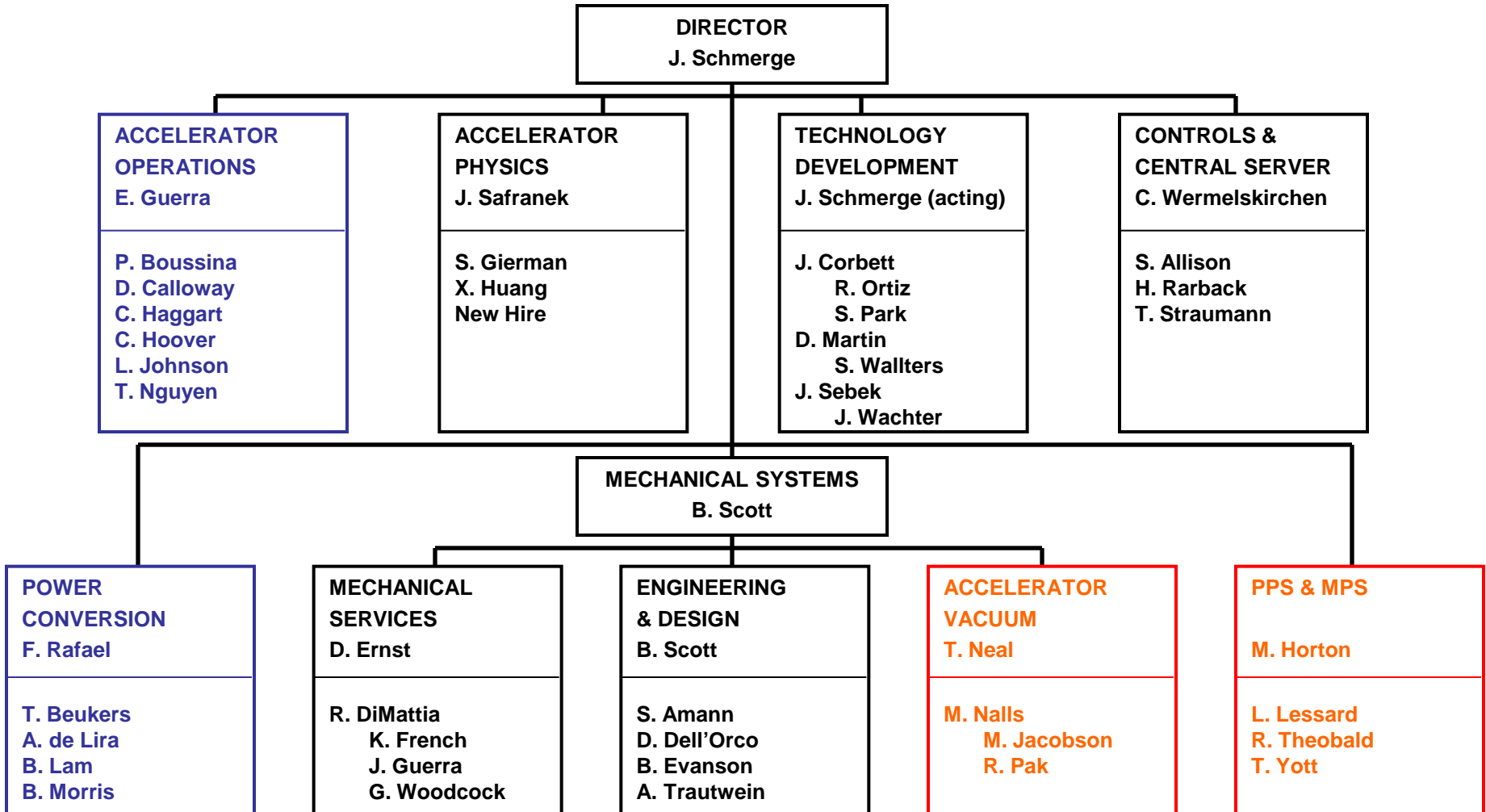
AD Organization Chart

*Matrixed to Research Program Leadership as Needed





SPEAR3 Accelerator Division



John Schmerge

SPEAR3 AD All Hands Meeting
November 24, 2009

○ (blue) – matrix from AD
○ (black) – SPEAR3 Core Team
○ (red) – matrix from SSRL



Changes

- **Electrical Systems**
 - PCD provides full sustaining engineering and upgrade support for SPEAR and injector power supplies
 - Electrical Systems Group members transferred to PCD, SSRL or merged with Technology Development Group
- **Utilizing more operations support systems**
 - E-log
 - CATER
 - Accelerator Department Safety Officer (ADSO) support
 - Documentation
- **Improved engineering and physics support from SLAC**
 - Service Level Agreements
 - Matrixed support
- **New Lab Wide Accounting System**
 - Old ASD accounts closed
 - Work Breakdown Structure (WBS)
 - Ben Scott is Cost Account Manager (CAM)



Service Level Agreements

- PCD
 - Provide full system sustaining engineering
 - DC power supplies
 - Pulsed power supplies
 - Provide engineering support for upgrade projects
- Klystron
 - SPEAR klystron support
 - Linac klystron support
- Metrology
 - Alignment services
- Engineering
 - Provide backup design support



System Managers

	<i>System Mngr.</i>	<i>Deputy</i>
1.0 Computer Control	C. Wermelskirchen	S. Allison
2.0 Lattice Control	J. Safranek	X. Huang
3.0 Orbit Control	J. Corbett	X. Huang
4.0 Timing Control	J. Sebek	R. Ortiz
5.0 Beam Monitoring & Diagnostics	D. Martin	J. Wachter
6.0 Gun & Linac	S. Gierman	J. Sebek
7.0 Power Conversion	below	
7.1 Power Conversion - SPEAR DC Power Supplies	A. de Lira	F. Rafael
7.2 Power Conversion - Special Power Supplies	B. Lam	F. Rafael
7.3 Power Conversion - Pulsed Power Supplies	T. Beukers	F. Rafael
7.4 Power Conversion - Modulators	B. Morris	F. Rafael
8.0 Machine Protection System	L. Lessard	M. Horton
9.0 Personnel Protection System	M. Horton	L. Lessard
10.0 Beam Containment System	J. Schmerge	D. Martin
11.0 RF - Booster	S. Park	J. Wachter
12.0 RF - SPEAR	J. Sebek	J. Wachter
13.0 LCW and Pneumatics	B. Scott	D. Ernst
14.0 Magnets	D. Dell'Orco	B. Scott
15.0 Insertion Devices	B. Scott	T. Dao
16.0 SLM and X-Ray Pinhole Facility	J. Corbett	J. Sebek
17.0 Thermocouple System	J. Corbett	R. Ortiz
18.0 Vacuum	B. Scott	T. Neal
19.0 Facilities	E. Guerra	B. Choi
20.0 Photon Systems	T. Rabedeau	B. Johnson



WPC

- Work Planning
 - Best to plan in advance and write procedures for complex work
 - Must not change the scope of the work without review
 - Continue getting authorization and release
 - Authorization from supervisor
 - Release from area manager
- Supervisors must perform periodic walkthroughs
 - Observe and verify work performed according to expectation
 - Document walkthroughs
 - ESH 139



Recent Projects

- Top-Off
 - Safety Tracking
 - Top-Off BCS
 - BTS Trajectory Correction
 - Replace injection septum vacuum chamber
 - Remove all windows between booster and SPEAR
- Injector Upgrade
 - New injection/extraction kicker power supplies
 - Transport line BPMs
 - Controls
 - Multiple feedback systems
 - Initial automated injection

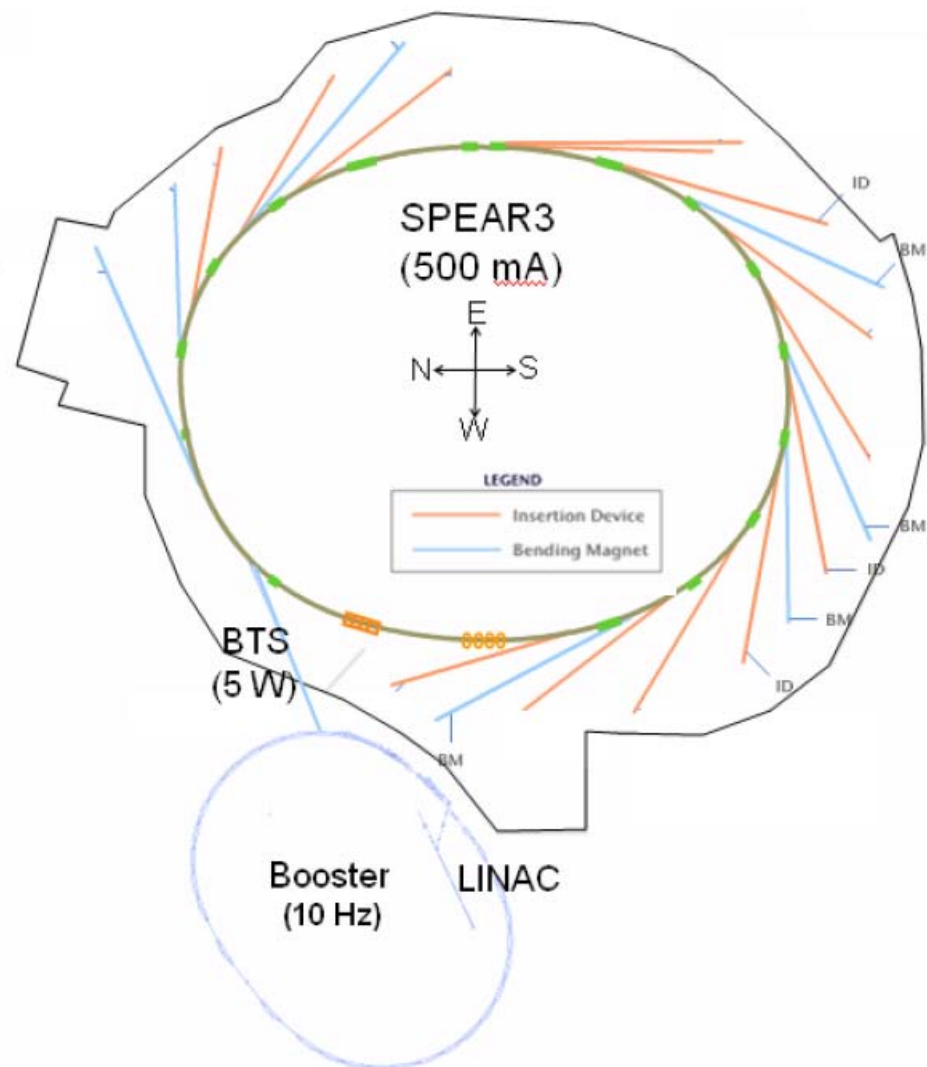


Current Projects

- Operations Support
- Facilities Improvements
 - B140 AC
 - BTS shielding/seismic upgrade
- Top-Off
 - BLs 1, 2, 4, 5, 6, 7, 9, 10, 11 approved
 - BLs 8,14 expected approval December
 - BLs 12, 13 safety tracking submitted to RP for approval in January
- 500 mA
 - BLs qualified up to 350 mA in February
 - BLs qualified up to 500 mA by end of run
- Automated Injection
 - Injection interval < 10 minutes
 - Testing control system and disturbance to user data collection during AP
 - Bunch X Bunch monitoring system
 - Transport line feedback systems
 - Commission SPEAR monitoring system
- Accelerator Reliability
 - Linac RF upgrade
 - Photo-cathode operation
 - Spare SPEAR HVPS installation
- Short Bunch and Timing Mode Operation
 - Short Bunch (≈ 1 ps) during AP for select users

Injector improvements for top-off

- Photocathode gun
- Linac feedbacks
- Increased linac energy
- Peaking strip upgrade
- Booster fast turn-on
- BTS vacuum rebuild
- New kicker pulsers
- Improved instrumentation
 - BPMs
 - Toroids
 - Pulsed signal monitoring
- Pulse trains (476 MHz booster)





Future Projects (1-5 years)



- Injector reliability upgrade
- Injector diagnostics upgrade
- Injector RF upgrade
- SPEAR slow orbit motion reduction
- Alternate SPEAR injection method
- SPEAR transverse multibunch feedback
- New BL (in-vacuum undulator)
- Low emittance SPEAR3 lattice
- Low emittance injector lattice



Future plans & ideas



- Complete Top-off, pulse train injection, nonlinear dynamics work, fix orbit drift.
- Short bunch development
 - LDRD funding to build THz beamline
 - Bunch cleaning
 - THz seeding (echo-like)??
- Lower emittance optics (5 nm?)
- Transverse multi-bunch feedback
- Alternate injection scheme
 - Pulsed sextupole?
 - SLAC linac?
- PEP-X



END