

Summary of WG2 Expressions of Interest

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*1st DRD3 Workshop,
Working Group 2 (WG2) Session
18th July 2024*

Goals and Results

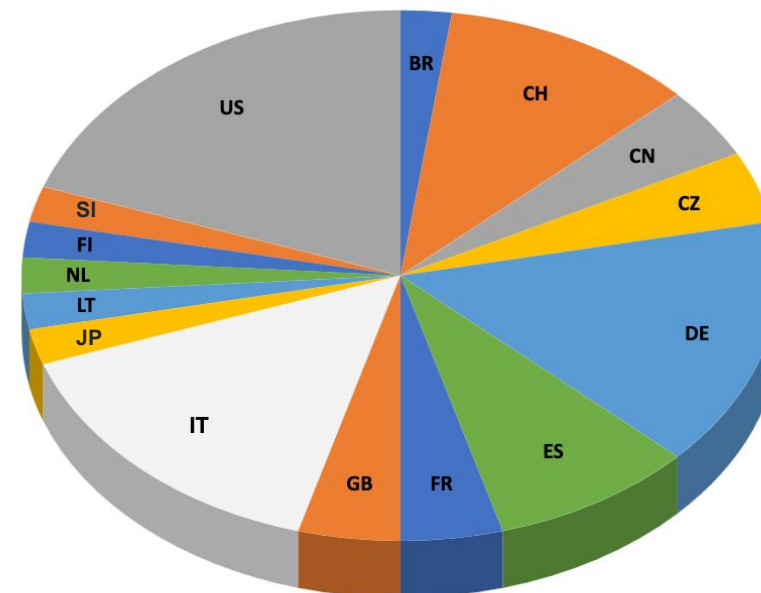
- **Goals of Expression of Interest**
 - Get an overview on the experience, expertise and infrastructure of the groups
 - Get an overview on the ongoing and planned research topics
 - Get an impression of the coverage of the research topics
 - This will help the conveners to shape the working group
- **Received 46 responses**
- **Results**
 - Large variation in the level of detail provided
 - Risk of misinterpretation

Institutes

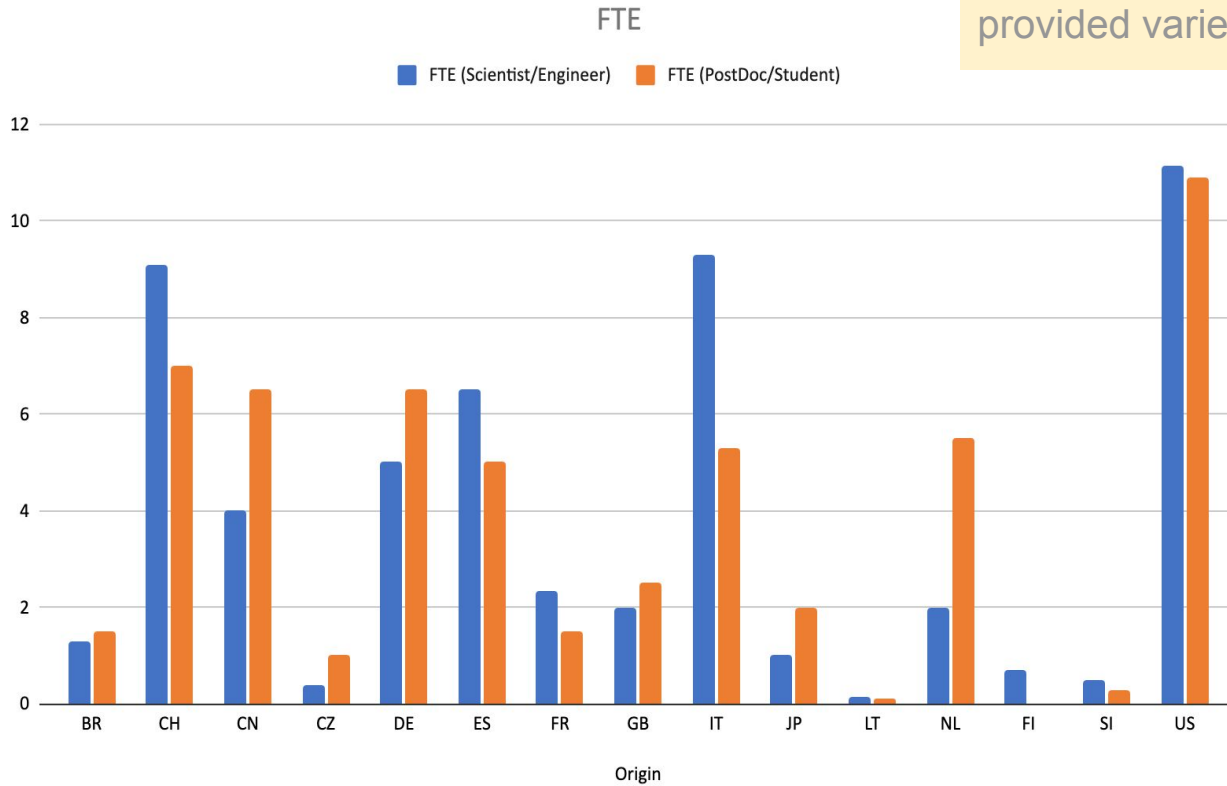
DRD3

ANL	UZH	Nikhef	IFAE
UNM	JSI	FZU Prague	IFGAE (Santiago)
IFCA (CSIC-UC)	LPNHE-Paris	Birmingham	Oxford
Charles University, Prague	MPP	Gottingen	Santa Cruz
BNL	INFN Milano	GSI	INFN Genova
CERN	Oak Ridge	INFN Torino	IJCLAB
IMB-CNM-CSIS	PSI	ETHZ	
FBK	SLAC	KEK	
FNAL	Uni Trento + TIFPA	KIT	
Freiburg	INFN	LANL	
IMECAS	Uni Chicago	Hamburg	
INFN-Firenze	Uni Sao Paulo USP	HEPHY	
INFN-Perugia	Uni Sci & Tech China	HIP (Helsinki Institute of Physics)	
	Vilnius		

- 46 Institutes
 - If you are not in this list contact us

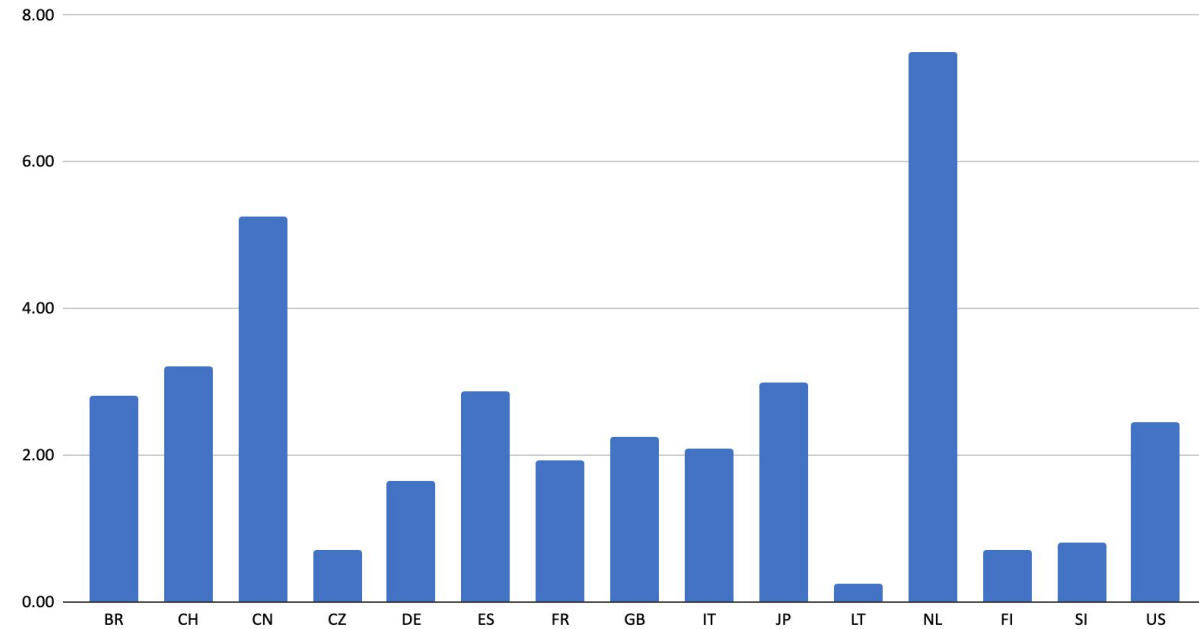


To be taken with caution as details provided varies between Eols



- 55 FTE for Scientists and Engineers
- 55 FTE for PostDocs and Students

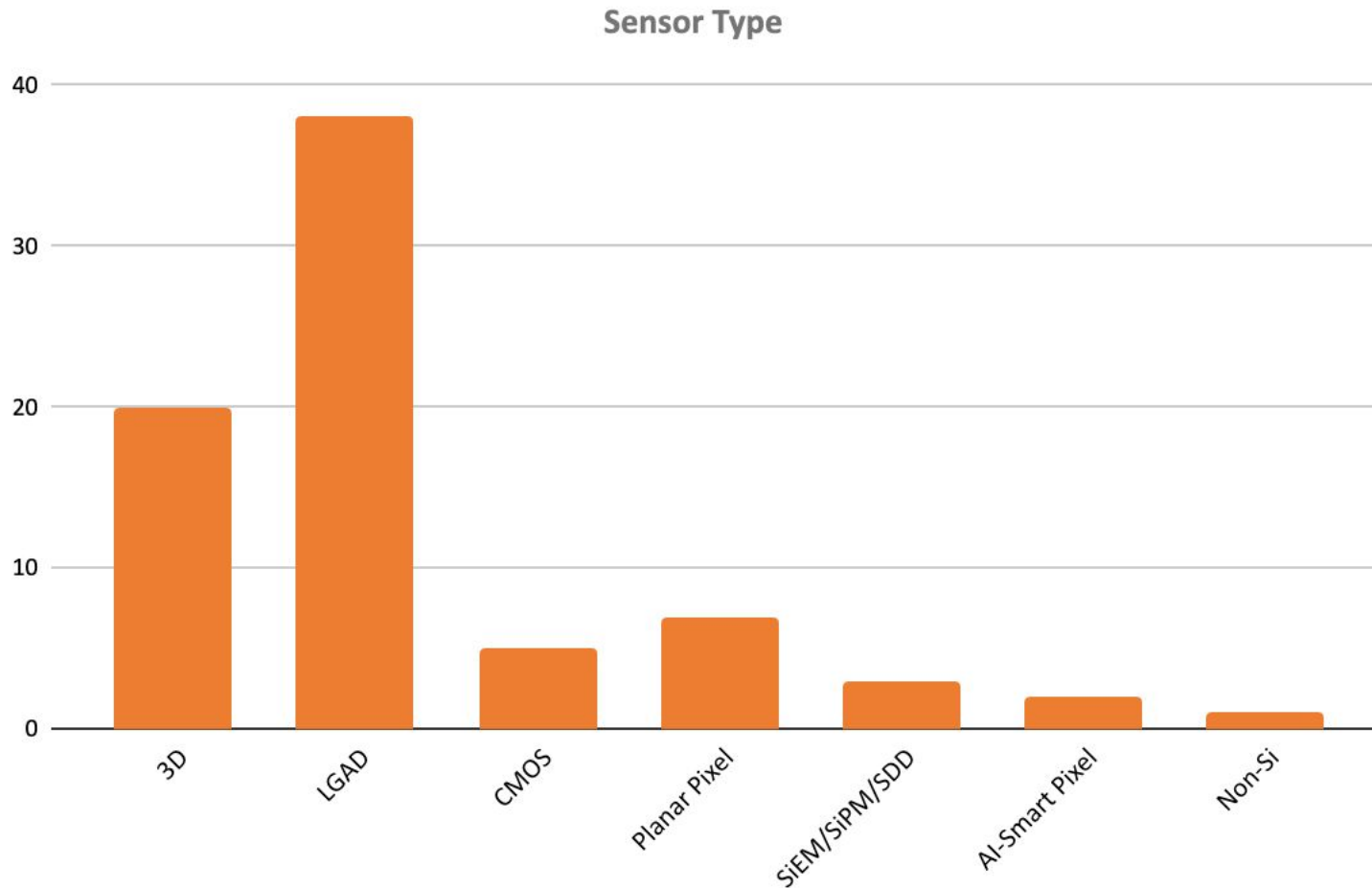
Ratio Tot. FTE / No. Institutes



- Average: 2.4 FTE / Institute

Scientific Interests

DRD3

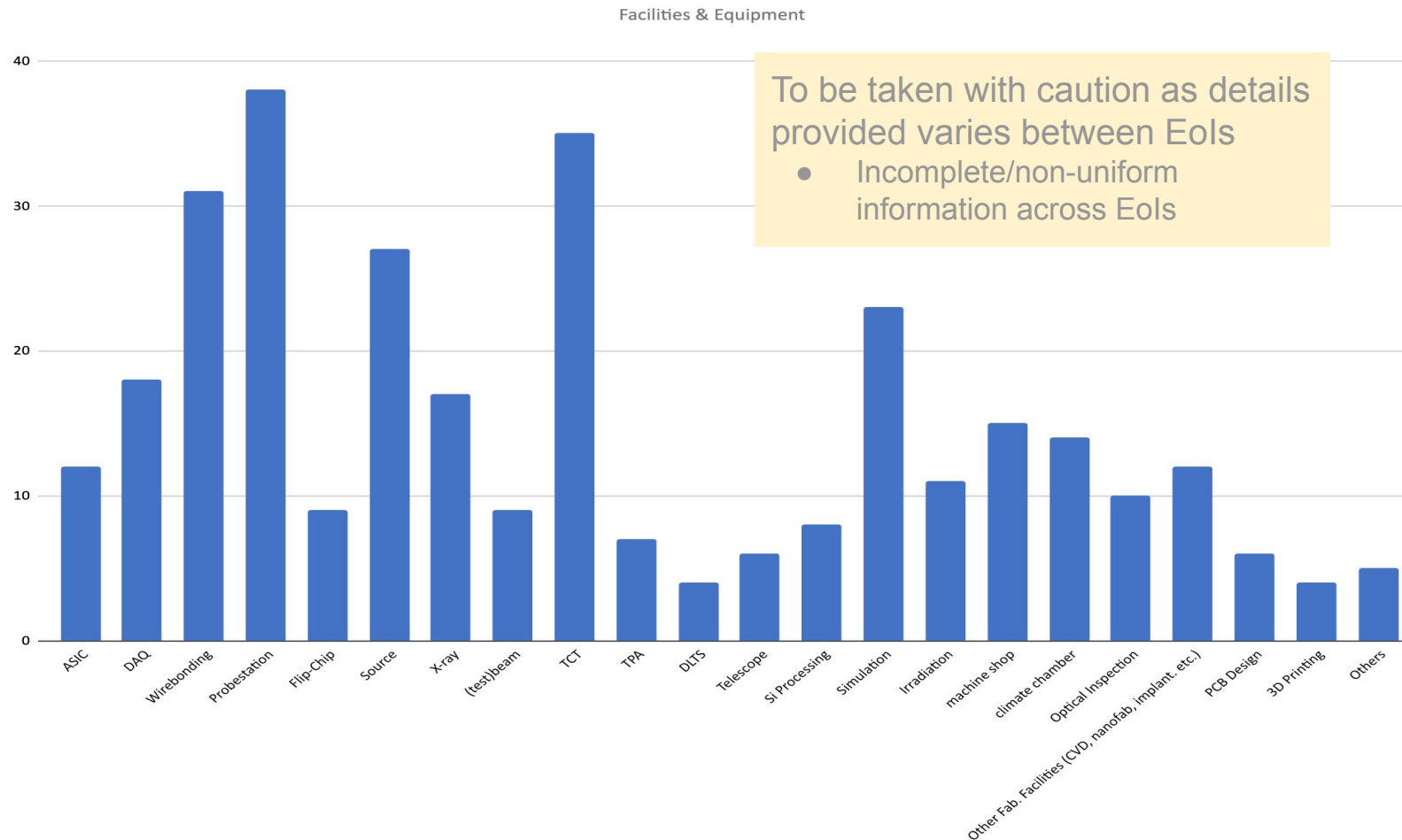


Most of institutes have extensive experience in silicon tracking or timing detectors in LHC experiments

- LGAD and 3D dominates
- Interest also in Planar Pixel, passive/active CMOS and other technologies

Facilities and Equipment

DRD3



- Broad technical capabilities
- Widespread testing equipment:
 - Probe-stations
 - TCT/laser
 - Radioactive sources
 - X-ray
 - Simulation
- Wire-bonding capabilities are also largely available
- Need coordination/sharing:
 - Test-beams
 - Irradiation
 - Readout development
 - Flip-chip

❖ Creation of public spreadsheet with info on Facilities/Equipment that can be shared within WG2

Conclusions

- **46 institutes from 15 counties submitted Eols**
 - Great participation from **Europe, US, Asia and South America**
 - It is not too late to join ⇒ *contact convenors*
- **Large effort planned: 110 FTEs, average of 2.4 FTE/Institute**
 - Effort evenly distributed between long-term staff and students/postdocs
 - To be taken with caution as information was non uniformly provided in Eols
- **Scientific interest converges primarily on LGAD and 3D technologies**
 - Significant interest also in Planar Pixels, including passive CMOS
 - New and alternative ideas are also welcome
- **Broad-spectrum of Facilities and Equipment**
 - Most institutes have sensor testing capabilities
 - Sharing of other resources is welcome and may be needed in specific clusters of institutes for specific projects
 - Focused survey will be launched to collect and publish information on facility and equipment that can be shared within WG2 for dedicated projects

WG2 Sessions in this DRD3 Workshop

DRD3

09:40	WG/WP2 - Hybrid silicon technologies - Alessandro Tricoli (Brookhaven National Laboratory (US)) Anna Macchiolo (University of Zurich (CH)) Martin Van Beuzekom (Nikhef National institute for subatomic physics (NL)) (until 13:15) (500/1-001 - Main Auditorium)
09:40	Introduction to WG2 - Martin Van Beuzekom (Nikhef National institute for subatomic physics (NL)) Anna Macchiolo (University of Zurich (CH)) Alessandro Tricoli (Brookhaven National Laboratory (US)) (500/1-001 - Main Auditorium)
10:00	Summary of Expression of Interest for WG2 - Martin Van Beuzekom (Nikhef National institute for subatomic physics (NL)) Anna Macchiolo (University of Zurich (CH)) Alessandro Tricoli (Brookhaven National Laboratory (US)) (500/1-001 - Main Auditorium)
10:15	Investigating LGAD Degradation with Proton Irradiation and the Novel nLGAD Technology - Veronika Kraus (Vienna University of Technology (AT)) (500/1-001 - Main Auditorium)
10:35	MARTHA - Monolithic Array of Reach THrough Avalanche photo diodes - Jelena Ninkovic (500/1-001 - Main Auditorium)
10:55	--- Coffee Break ---
11:25	Synchrotron light source X-ray detection with Low-Gain Avalanche Diodes - Marco Lisboa Leite (Universidade de Sao Paulo (BR)) (500/1-001 - Main Auditorium)
11:45	3D silicon sensors as timing detectors - Leena Diehl (CERN) (500/1-001 - Main Auditorium)
12:05	Technology Transfer of LGAD Technology for Large-Volume Productions - Giovanni Paternoster (Fondazione Bruno Kessler) (500/1-001 - Main Auditorium)
12:25	ML-processed Silicon Device signal-sharing with BNL AC-LGAD sensors - Daniel Li (Brown University (US)) Gaetano Barone (Brown University) (500/1-001 - Main Auditorium)
12:35	Precision timing silicon detectors for future high energy collider experiments - Koji Nakamura (High Energy Accelerator Research Organization (JP)) (500/1-001 - Main Auditorium)
12:45	RD50 Common Fund Project - RD50-2023-09: State-of-the-art Radiation Resistant AC-coupled Resistive LGAD - RadHard AC-LGAD - Roberta Arcidiacono (Universita e INFN Torino (IT)) (500/1-001 - Main Auditorium)
12:55	RD50 Common Fund Project - RD50-2023-03: Deep Junction LGAD - Dr Simone Michele Mazza (University of California,Santa Cruz (US)) (500/1-001 - Main Auditorium)

13:00	--- Lunch break ---
14:00	WG/WP2 - Hybrid silicon technologies - Alessandro Tricoli (Brookhaven National Laboratory (US)) Martin Van Beuzekom (Nikhef National institute for subatomic physics (NL)) Anna Macchiolo (University of Zurich (CH)) (until 15:30) (500/1-001 - Main Auditorium)
14:00	Riddle of puzzling ghosts in double trench isolated TI-LGADs - Gordana Lastovicka Medin (University of Montenegro (ME)) (500/1-001 - Main Auditorium)
14:20	First characterisation of Trench Isolated LGADs fabricated at Micron Semiconductor Ltd - Fasih Zareef (AGH University of Krakow (PL)) (500/1-001 - Main Auditorium)
14:40	Gain measurements and spectral response of the latest IMB-CNM fabricated nLGAD - Pablo Fernandez-Martinez (IMB-CNM, CSIC) (500/1-001 - Main Auditorium)
15:00	--- Coffee Break ---

15:30	WG/WP2 - Hybrid silicon technologies - Alessandro Tricoli (Brookhaven National Laboratory (US)) Anna Macchiolo (University of Zurich (CH)) Martin Van Beuzekom (Nikhef National institute for subatomic physics (NL)) (until 17:50) (500/1-001 - Main Auditorium)
15:30	LGAD development at the IMB-CNM - Pablo Fernandez-Martinez (IMB-CNM, CSIC) (500/1-001 - Main Auditorium)
15:40	From analog readout to ML-processed Silicon Device signal-sharing and LGADs at BNL - Gaetano Barone (Brown University) (500/1-001 - Main Auditorium)
15:50	Development of precision timing silicon detectors for future high energy collider experiments - Koji Nakamura (High Energy Accelerator Research Organization (JP)) (500/1-001 - Main Auditorium)
16:00	AC-LGAD based Timing tracker development for future lepton collider - Zhijun Liang (Chinese Academy of Sciences (CN)) (500/1-001 - Main Auditorium)
16:10	LGAD development at Teledyne and Micron - Richard Bates (Department of Physics and Astronomy-University of Glasgow) (500/1-001 - Main Auditorium)
16:20	Research and development of 3D detector and LGAD based on 8-inch CMOS Process - Jun Luo (Institute of Microelectronics, Chinese Academy of Sciences (IMECAS)) Zhihua Li (Institute of Microelectronics, Chinese Academy of Sciences (IMECAS)) Zheng Li Manwen Liu (Chinese Academy of Sciences (CN)) Huaxiang Yin (Institute of Microelectronics, Chinese Academy of Sciences (IMECAS)) Gaobo Xu (Institute of Microelectronics, Chinese Academy of Sciences (IMECAS)) (500/1-001 - Main Auditorium)
16:30	Development of TI-LGAD technology towards 4D Tracking - Anna Macchiolo (University of Zurich (CH)) (500/1-001 - Main Auditorium)
16:40	Development of very small pitch, ultra rad-hard 3D sensors for tracking + timing applications at FBK - Maurizio Boscardin (Fondazione Bruno Kessler (IT)) Maurizio Boscardin (FBK Trento) (500/1-001 - Main Auditorium)
16:50	3D activities and plans for the VELO upgrade - Kazuyoshi Carvalho Akiba (Nikhef) (500/1-001 - Main Auditorium)
17:00	Discussion on WG2 Plans and Projects (500/1-001 - Main Auditorium)

- Session 1 (9:40-13:00):
Scientific Presentations
- 11 Talks
- Session 2 (14:00-15:00):
Scientific Presentations
- 3 Talks
- Session 3 (15:30-17:30):
Projects Proposals
- 10 Talks