



Lancaster
University



34th RD50 Workshop

Lancaster University

12-14.6.2019



RD50 News

Gianluigi Casse

FBK, Italy and
University of Liverpool, UK

Michael Moll

CERN EP-DT, Geneva,
Switzerland

12 June 2019

Michael Moll

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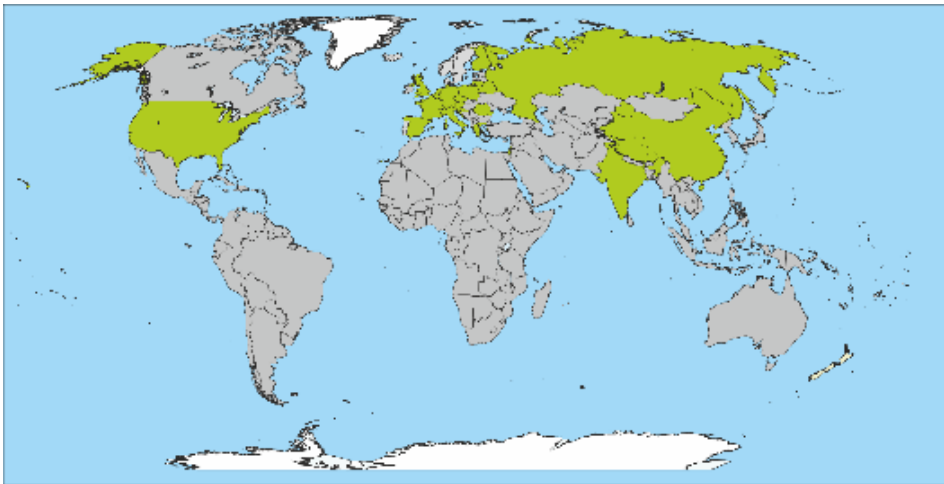
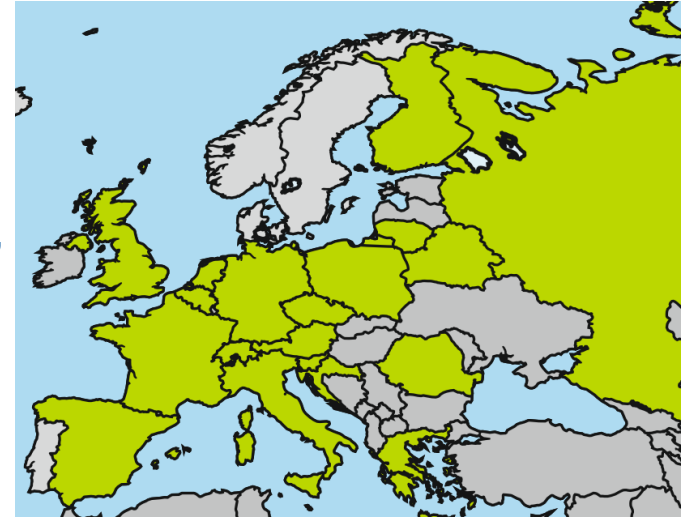
The RD50 Collaboration



- RD50: 60 *institutes and 360 members*

50 European institutes

Austria (HEPHY), Belarus (Minsk), Czech Republic (Prague (3x)), Finland (Helsinki, Lappeenranta), France (Marseille, Paris, Orsay), Germany (Bonn, Dortmund, Freiburg, Göttingen, Hamburg (2x), Karlsruhe, Munich(2x)), Greece (Demokritos), Italy (Bari, Perugia, Pisa, Trento, Torino), Croatia (Zagreb), Lithuania (Vilnius), Netherlands (NIKHEF), Poland (Krakow), Romania (Bucharest), Russia (Moscow, St.Petersburg), Slovenia (Ljubljana), Spain (Barcelona(3x), Santander, Sevilla (2x), Valencia), Switzerland (CERN, PSI, Zurich), United Kingdom (Birmingham, Glasgow, Lancaster, Liverpool, Oxford, Manchester, RAL)



7 North-American institutes

USA (BNL, Brown Uni, Fermilab, LBNL, New Mexico, Santa Cruz, Syracuse)

1 Middle East institute

Israel (Tel Aviv)

2 Asian institute

China (Beijing-IHEP), India (Delhi)

RD50 Organizational Structure



Co-Spokespersons

Gianluigi Casse and *Michael Moll*
(Liverpool University, UK & FBK-CMM, Trento, Italy) (CERN EP-DT)

Defect / Material Characterization

Ioana Pintilie
(NIMP Bucharest)

- Characterization of microscopic properties of standard-, defect engineered and new materials; pre- and post- irradiation
- DLTS, TSC,
- SIMS, SR, ...
- NIEL (calculations)
- Cluster and point defects
- Boron related defects

Detector Characterization

Eckhart Fretwurst
(Hamburg University)

- Characterization of test structures (IV, CV, CCE, TCT,..)
- Development and testing of defect engineered devices
- EPI, MCZ and other materials
- NIEL (experimental)
- Device modeling
- Operational conditions
- Common irradiations

- Wafer procurement (M.Moll)
- Acceptor removal (Kramberger)
- **TCAD modeling (J.Schwandt)**

New Structures

Giulio Pellegrini
(CNM Barcelona)

- 3D detectors
- Thin detectors
- Cost effective solutions
- Other new structures
- Detectors with internal gain
- LGAD: Low Gain Avalanche Det.
- Deep Depleted Avalanche Det.
- Slim Edges
- HVC MOS

- LGAD (S.Hidalgo)
- HVC MOS (E. Vilella)
- Slim Edges (V.Fadeyev)

Full Detector Systems

Gregor Kramberger
(Ljubljana University)

- LHC-like tests
- Links to HEP (LHC P2, FCC)
- Links electronics R&D
- Low rho strips
- Sensor readout (Alibava)
- Comparison:
 - pad-mini-full detectors
 - different producers
- Radiation Damage in HEP detectors
- Timing detectors

- Test beams (M.Bomben & G.Casse)

Collaboration Board Chair & Deputy: G.Kramberger (Ljubljana) & J.Vaitkus (Vilnius), Conference committee: U.Parzefall (Freiburg)
CERN contact: M.Moll (EP-DT), Secretary: V.Wedlake (EP-DT), Budget holder & GLIMOS: M.Moll & M.Glaser (EP-DT)

RD50-MOU



- RD50 has now a “proper” Memorandum of Understanding
- Status
 - 60 versions signed by Eckhart Elsen (CERN Research Director) end of May



60 MoUs piled up in the office of Eckhart Elsen

- Now in distribution to the institutes for signature
- CERN Document Server (CDS) – official number
 - CERN-MOU-2019-023
 - <http://cds.cern.ch/record/2670537>

LHCC and Research Board



- LHCC chairman (new): Frank Simon (MPI - Munich); replacing Francesco Forti (Pisa & INFN)
- LHCC referee for RD50: Katja Krüger (CERN)
- 5 year work program submitted in May 2018
 - Approved by CERN Research Board in June 2018 (minutes: July 2018)
- Next LHCC review for RD50: 11 September 2019

• Workplan [70 milestones]

• Defect and Material Characterization

- p-type silicon [7 MS]
- Cluster defects [4 MS]
- Theory of defects [5 MS]

• Device Characterization and Device Simulation

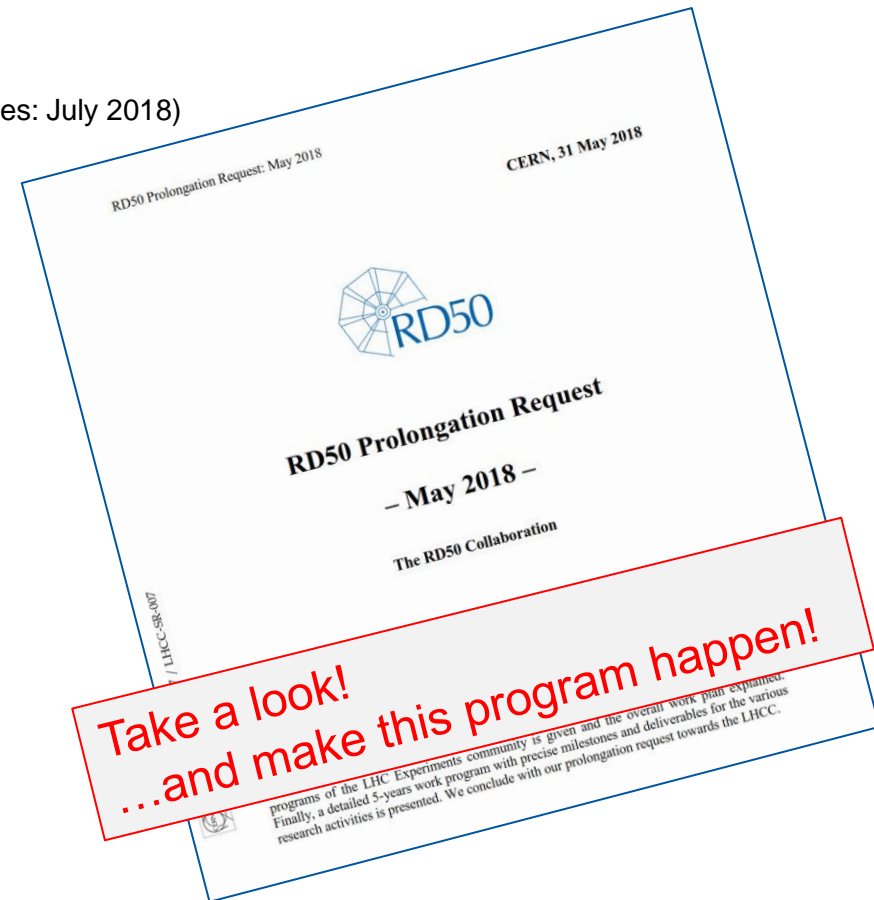
- Silicon materials [5 MS]
- Extreme fluences [5 MS]
- Experimental techniques [3 MS]
- Surface damage [1 MS]
- TCAD simulations [7 MS]

• New structures

- 3D sensors [6 MS] ; LGAD [4 MS]
- CMOS [6 MS] ; New Materials [5 MS]

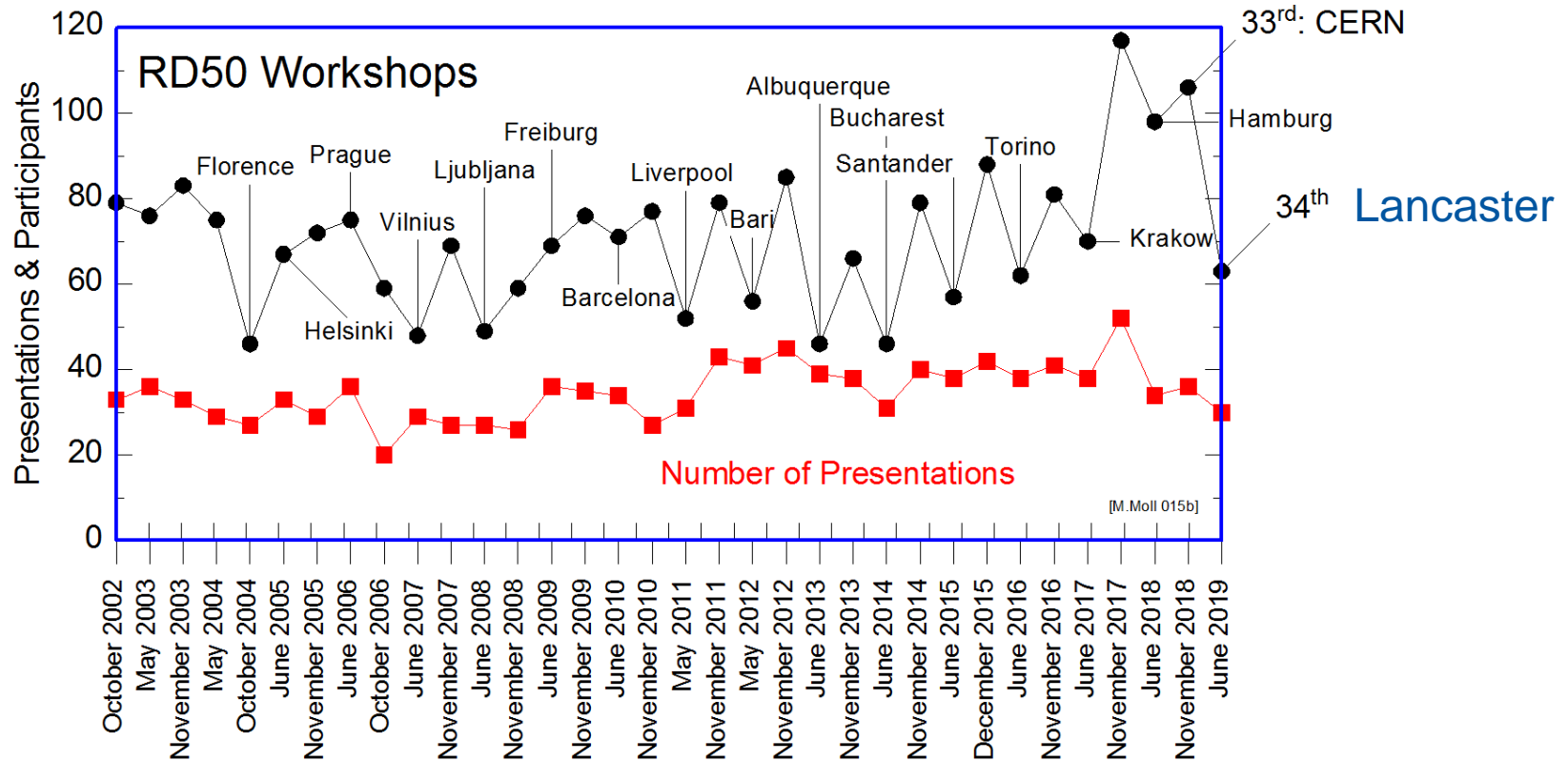
• Full Detector Systems

- LHC [7 MS]; HL-LHC [3 MS]
- FCC [2 MS]



<https://cds.cern.ch/record/2320882/files/LHCC-SR-007.pdf>

Workshop statistics



- Less participation than recent workshops, but in line with overall average
- Average numbers for outside CERN RD50 Workshops: <34 talks> <61 participants>
- Next workshops: November 2019 CERN; June 2020: Zagreb, Croatia

Program



- **Wednesday**
 - LGAD
 - Collaboration Board (closed session)
- **Thursday morning**
 - Defect Characterization / Detector Characterization
 - Radiation Facilities / Material Engineering
- **Thursday afternoon**
 - Simulations
- **Friday morning**
 - CMOS sensors



Enjoy the Workshop!

- *...many thanks to Daniel and his team!*