

# RD 51 Collaboration News

Leszek Ropelewski (CERN) / Maxim Titov (CEA Saclay)

HOW  
everything  
has started ?

...  
Kick-off  
Meeting  
(CERN):  
September  
10-11, 2007 !

...  
**RD51  
Collaboration  
2008-2013 !!!**

Micro Pattern Gas Detectors: Towards an R&D Collaboration  
<http://indico.cern.ch/conferenceDisplay.py?confId=16213>



# How Everything Has Started (2008-2013) ...



**2008 (Original MoU):**

**54 RD51 Institutes**

**December 2013:**

**91 RD51 Institutes**

**First (Very Preliminary) R & D Proposal**

**1<sup>st</sup> RD51 Meeting: April, 2008 – NIKHEF, Amsterdam**

**Development of Micro-Pattern Gas Detectors Technologies**

Editors: Alain Bellerive (Carleton University), Michael Campbell (CERN), Mar Capeans (CERN), Paul Colas (CEA Saclay), Rui de Oliveira (CERN), Werner Riegler (CERN), Leszek Ropelewski (CERN), Fulvio Tessarotto (INFN Trieste), Maxim Titov (CEA Saclay) and Rob Veenhof (CERN)

**Today: 13<sup>th</sup> RD51 Collaboration Meeting (Feb. 5-7, 2014)**  
**<https://indico.cern.ch/conferenceOtherViews.py?view=standard&confId=283108>**

**Wednesday, February 5 (30-7-018 - Kjell Johnsen Auditorium)**

**10:00 – 12:00 RD51 Collaboration Board Meeting**  
**13:00 – 15:00 RD51 Collaboration Plenary session**  
**15:00 - 19:00 WG4 Software**

**Thursday, February 6 (30-7-018 - Kjell Johnsen Auditorium)**

**09:00 – 13:00 WG1 MPGD Technologies and New Structures**  
**14:00 – 15:45 WG6 Production**  
**15:45 - 16:15 WG7 Test Beams**  
**16:15 - 18:00 EU H2020 Discussion / MPGD Community Input**  
**20:00 - 23:00 RD51 Collaboration Dinner (let us know if you are interested)**

**Friday, Friday 7 (30-7-018 - Kjell Johnsen Auditorium)**

**09:00 – 13:00 WG5 Electronics**  
**14:00 - 17:00 WG2 Physics Issues**



# RD51 Prolongation for the 5-Years Term (2014-2018)

## LHCC Minutes (June 12-13, 2013):

In summary, **RD51 is a successful R&D Collaboration with well-defined and important future plans.** In view of the above and given the modest request for resources for further work, the referees **recommend** that the **RD51 R&D** project be **continued for five years beyond 2013** and for CERN to continue to provide the limited requested support to the Collaboration. A status report is expected to be submitted to the LHCC in one year's time. The Committee **agrees** to the continuation of the project on this basis.

## CERN Research Board Minutes (August 28, 2013):

Existing **R&D projects RD39, RD42, RD50 and RD51** were reviewed. **RD39 studies** 3D-trenched, cryogenic charge injection devices (CID) and CVD diamond detectors, with applications for beam monitoring at the LHC. The LHCC recommends emphasis on the BLM development, and R&D on the CID sensors should be progressively integrated into RD42 and RD50. **RD42 is comparing** scCVD and pCVD detectors, with applications in specialized detectors such as the PLT for CMS and BCM for ATLAS, and with potential for pixel detectors. **RD50 is a productive** and diversified R&D collaboration for radiation-hard semiconductor development. **RD51 is a large collaboration** studying advanced gas-avalanche micro-pattern gas detectors (MPGD) of various types and readout technologies. **The Research Board approved the continuation of these projects for the coming year;** for RD39 further continuation would be subject to new results being produced during that time; **for RD51 the approval is for five years.**

# 2013: USA Snowmass Instrumentation Frontier Report

## Instrumentation Frontier Report

Conveners: M. Demarteau, R. Lipton, H. Nicholson, I. Shipsey

A. Albayrak-Yetkin, J. Alexander, J. Anderson, M. Artuso, D. Asner, R. Ball, M. Battaglia, C. Bebek, J. Beene, Y. Benhammou, E. Bentfour, M. Bergevin, A. Bernstein, B. Bilki, E. Blucher, G. Bolla, D. Bortoletto, N. Bowden, G. Brooijmans, K. Byrum, B. Cabrera, G. Cancelo, J. Carlstrom, B. Casey, C. Chang, J. Chapman, C.H. Chen, I. Childres, D. Christian, M. Convery, W. Cooper, J. Corso, J. Cumalat, P. Cushman, C. Da Via, S. Dazeley, P. Debbins, G. Deptuch, S. Dhawan, V. Di Benedetto, B. DiGiuseppe, Z. Djuricic, S. Dye, A. Elagin, J. Estrada, H. Evans, E. Etzion, J. Fast, C. Ferretti, P. Fisher, B. Fleming, K. Francis, P. Friedman, H. Frisch, M. Garcia-Sciveres, C. Gatto, G. Geronimo, G. Gilchriese, S. Golwala, C. Grant, A. Grillo, E. Grünendahl, P. Gorham, L. Guan, G. Gutierrez, C. Haber, J. Hall, G. Haller, C. Hast, U. Heintz, T. Hemmick, D. Hitlin, C. Hogan, M. Hohlmann, E. Hoppe, L. Hsu, M. Huffer, K. Irwin, F. Izraelvitch, G. Jennings, M. Johnson, A. Jung, H. Kagan, C. Kenney, S. Kettell, R. Khanna, V. Khristenko, F. Krennrich, K. Kuehn, R. Kutschke, J. Learned, A.T. Lee, D. Levin, T. Liu, A.T.K. Liu, D. Lissauer, J. Love, D. Lynn, D. MacFarlane, S. Magill, S. Majewski, J. Mans, J. Maricic, P. Marleau, A. Mazzacane, D. McKinsey, J. Mehl, A. Mestvirivilli, S. Meyer, N. Mokhov, M. Moshe, A. Mukherjee, P. Murat, S. Nahn, M. Narain, P. Nadel-Turonski, M. Newcomer, K. Nishimura, D. Nygren, E. Oberla, Y. Onel, M. Oreglia, J. Orrell, J. Paley, A. Para, S. Parker, V. Polychronakos, S. Pordes, P. Privitera, A. Prosser, M. Pyle, J. Raaf, E. Ramberg, R. Rameika, B. Rebel, J. Repond, D. Reyna, L. Ristori, R. Rivera, A. Ronzhin, R. Rusack, J. Russ, A. Ryd, H. Sadrozinski, H. Sahoo, M. Sanchez, C. Sanzeni, S. Schmetzer, S. Seidel, A. Seiden, I. Schmidt, A. Shenai, T. Shutt, Y. Silver, W. Smith, D. Snowden-Ifft, A. Sonnenschein, D. Southwick, L. Spiegel, M. Stanitzki, S. Striganov, D. Su, R. Sumner, R. Svoboda, M. Sweany, R. Talaga, R. Tayloe, S. Tentindo, N. Terentiev, J. Thom-Levy, C. Thorn, J. Tiffenberg, W. Trischuk, R. Tschirhart, M. Turner, D. Underwood, L. Uplegger, J. Urheim, M. Vagins, K. Van Bibber, G. Varner, R. Varner, J. Va'vra, H. Von der Lippe, R. Wagner, S. Wagner, C. Weaverdyck, H. Wenzel, A. Weinstein, M. Wetstein, A. White, R. Wigmans, P. Wilson, D. Winn, P. Winter, C. Woody, L. Xia, J.Q. Xie, Z. Ye, M.F. Yeh, T. Yetkin, J.H. Yoo, J. Yu, J.M. Yu, S. Zeller, J.L. Zhang, J.J. Zhu, B. Zhou, R.Y. Zhu, B. Zitser

Contribution to “Large – Area Arrays”:  
(special thanks to  
M. Hohlmann, R. Rusack, A. White):

[http://www.snowmass2013.org/  
tiki-index.php?page=Instrumentation%20Frontier](http://www.snowmass2013.org/tiki-index.php?page=Instrumentation%20Frontier)

“Micro-pattern gas detectors (MPGDs) for charged particle tracking and muon detection are an alternative to pixelated silicon vertex and tracking detectors [85]. These low-mass detectors have the potential of economically covering large areas and provide high tolerance against radiation damage, high spatial resolution (of order  $10\mu\text{m}$ ), and good time resolution (of order 1ns). Future work is needed to reduce the readout cost by developing highly integrated, radiation-hardened front-end readout electronics with at least 4000 channels/chip and high density detector electronics interconnects and integrating ex-circuit readout electronics directly into the MPGD structure. Work is also required to develop innovative signal induction structures to reduce cost, improve performance, and provide stability against electric breakdown. It is important to develop materials with resistance to aging and radiation damage, as well as cost-effective MPGD construction techniques for high-volume production.”



# June 2013: RD51 Events - MPGD Conference and Collaboration Meeting in Zaragoza

3rd International Conference on Micro Pattern Gaseous Detectors

## MPGD2013

01-04 July 2013 - Zaragoza (Spain)  
RD-51 Collaboration Meeting on July 5-6

### Topics in:

- New developments in MPGDs
- Production techniques
- Performance tests
- MPGD detector physics
- Simulation and software
- Electronics
- Applications

<http://gifna.unizar.es/mpgd13>

### Advisory Committee

- T. Bohmke (DESY)
- R. Bellazzini (INFN Pisa)
- A. Broekhin (Kurchatov Institute)
- P. Colas (CEA Saclay)
- G. Fanourakis (HCSR De molinos)
- S. Dalla Torre (INFN Trieste)
- H. van der Geest (NIKHEF)
- J. Haba (KEK)
- J. Jaros (SLAC)
- T. Matsuoka (KEK)
- W. Riegler (CERN)
- L. Ropelewski (CERN)
- F. Sauli (FERA, Fondazione)
- T. Tanimori (Kyoto Univ.)
- M. Titov (CEA Saclay)

### International Organizing Committee

- A. Cardini (INFN Cagliari)
- K. Boser (GIF Bonn)
- Th. Goralis (HCSR De molinos)
- I. Giomataris (CEA Saclay)
- T. Kawamoto (ICIPP Tokyo)
- A. Oishi (Kobe Univ.)
- V. Poljanski (BNL)
- K. Sharma (CERN)
- A. White (U. Texas Arlington)
- J. Wotawa (CERN)

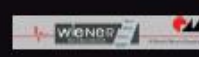
### Local Organizing Committee

- Igor G. Instonza (U. Zaragoza) (Chair)
- J. A. Villar (U. Zaragoza)
- G. Luahn (U. Zaragoza)
- S. Corbijn (U. Zaragoza)
- Th. Darfi (U. Zaragoza)
- D. González-Díaz (U. Zaragoza)

### Technical Support

- A. Ortiz de Solórzano
- F. J. Mora

Sponsored by



More information: <http://gifna.unizar.es/mpgd13> or [mpgd2013@gmail.com](mailto:mpgd2013@gmail.com)

MPGD2013

## Micropattern-detector experts meet in Zaragoza

There is much on offer in the rapidly growing technology of MPGDs, thanks to the creativity of the research community.

Micropattern gaseous detectors (MPGDs) are the modern heirs of multiwire proportional counter (MWPC) planes, with the wires replaced by microstructures that are arranged on a etched silicon



### Three winners of the Charpak Award:

activity that the series of international conferences on micropattern gaseous detectors was initiated, with the first taking place in Crete in 2009 followed by the second meeting in Kobe in 2011 (CERN Courier March 2012 p27).

The third conference – MPGD2013 – moved to Spain, bringing more than 125 physicists, engineers and students to the Pansino building of the Universidad de Zaragoza during the first week of July. The presentations and discussions took place in the same room that, about a century ago, Santiago Ramón y Cajal – the most prominent Spanish winner of a scientific Nobel prize – studied and taught in. The Pansino is the university's oldest building and its halls, corridors and stairs provided an impressive setting for the conference. The streets, bars and restaurants of Zaragoza – the capital of Aragon – were further subjects for the conference participants to discover. After an intense day of high-quality science, lively discussions often continued into the evening and sometimes late into the night, helped by a variety of tapas and wines.

The wealth of topics and applications that were reviewed at the conference reflected the current exciting era in the field. Indeed, the large amount of information and number of projects that were presented make it difficult to summarize the most relevant ones in a few lines. The following is a personal selection. Readers who would like more detail can browse the presentations that are posted on the conference website, including the excellent and comprehensive conference-summary talk given by Silvia Dalla Torre of INFN/Trieste on the last day.

The meeting started with talks about experiments in high-energy and nuclear physics that are using (or planning to use) MPGDs.



The three winners of the Charpak Award. (Top) Ioannis Giomataris, left, congratulates Takeshi Fujiwara. (Image credit: F Iguez.) (Above) Michael Lupberger, left, and Diego González-Díaz with their awards. (Image credit: J Kaminski.)

Since the pioneering implementation of GEM and Micromegas detectors by the COMPASS collaboration at CERN – the first large-scale use of MPGDs in high-energy physics – they have spread to many more experiments. Now all of the LHC experiment collaborations plan to install MPGDs in their future upgrades. The most impressive examples, in terms of detector area, are the 1200 m<sup>2</sup> of Micromegas modules to be installed in the muon system of ATLAS and the 1000 m<sup>2</sup> of GEM modules destined for the forward muon spectrometer of CMS. These examples confirm that MPGDs are the technology of choice when large areas need to be covered with high granularity and occupancy in a cost-effective way. These numbers also imply that transferring the fabrication know-how to industry is a must. A good deal of effort is currently devoted to industrialization of MPGDs and this was also an important topic at the conference.

MPGDs have found application in other fields of fundamental research. Some relevant examples that were discussed at [ ]



# 14-15 October 2013: 1<sup>st</sup> RD51 Academia – Industry Matching Event “Special Workshop on Neutron Detection with MPGDs”



**Research + industry + potential users focused on dedicated applications**

**91 participants:** <https://indico.cern.ch/conferenceDisplay.py?confId=265187>



# 14-15 October 2013: 1<sup>st</sup> RD51 Academia – Industry Matching Event

## “Special Workshop on Neutron Detection with MPGDs”



Globe of Science

### Summary papers based on workshop contributions:

- Richard Hall-Wilton: “The importance of defining proper methods to characterize the detectors; detector needs for ESS”
  - Bruno Guerard: “Status of MPGDs already used in NSS; fabrication and physical constraints of neutron gas detectors”
  - Fabrizio Murtas: “Performance of MPGDs, and development status in HEP”
  - Robert McKeag: “Lesson learned from a technology transfert from NSS to the industry”
- The follow-up RD51 session is expected in one year (end of 2014) ...



# 2014 RD51 Collaboration Meetings and Communications:

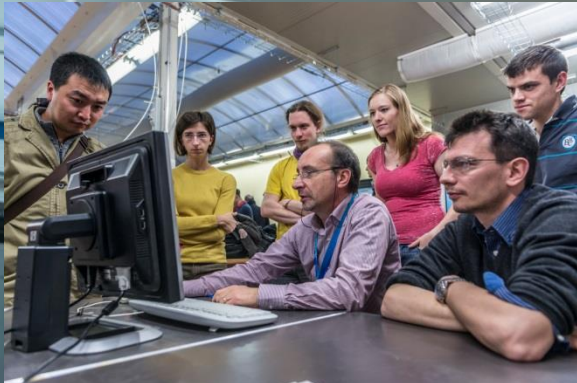
- **5 - 7 February: RD51 Collaboration Meeting (CERN)**  
**3 - 5 February: RD51 Electronics School (CERN)**
- **16 – 20 June: RD51 Mini-Week (CERN)**  
**16 – 17 June: 2nd Academia-Industry Matching Event**  
**(Special RD51/HEPTECH Workshop on dissemination of the**  
**MPGD technologies "Detecting Photons with MPGDs")**
- **September/October: RD51 Collaboration Meeting (OUTSIDE CERN)**  
**Two proposals received: Kolkata, India and Aveiro, Portugal**
- **8-12 December: RD51 Mini-Week (CERN)**

## Communications:

- **RD51 Collaboration Meetings Agenda:**  
<http://rd51-public.web.cern.ch/RD51-Public/Meetings/CollaborationMeetings.html>
- **CB minutes:**  
<https://espace.cern.ch/test-RD51/CB%20meeting%20minutes/Forms/AllItems.aspx>
- **MB minutes:**  
<https://espace.cern.ch/test-RD51/MB%20meetings/Forms/AllItems.aspx>

# RD51 SRS Electronics School (February 3 – 5, 2014)

30 participants from the RD51 Collaboration Institutes: Lectures & Training Sessions  
<https://indico.cern.ch/conferenceDisplay.py?confId=283113>



➤ RD51 SRS Electronics School Pictures: <http://cds.cern.ch/record/1646429?ln=en>



# RD51 SRS Electronics School (February 3 – 5, 2014)

Tremendous amount of work →

Fantastic school organization by  
Hans, Eraldo and team of 12  
speakers and supervisors

→ VERY WELL RECEIVED BY  
PARTICIPANTS

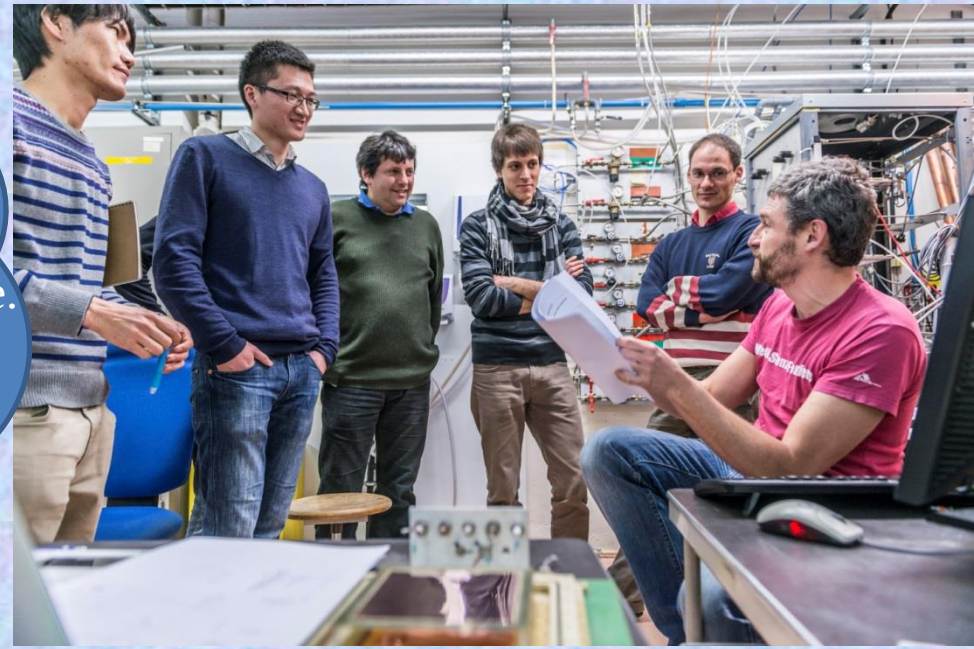
THANK YOU VERY MUCH !!!



Training improved as school progressed  
(Eraldo mail to Hans, Monday late night):

Silent people doesn't mean sleeping people.  
They got a lot of info and they probably  
need time to elaborate.

If you want we can test today with  
the high voltage if they are silent  
or sleeping!?!)



# RD51 Common Projects (2011, 2012) and Future

## 2012: 3 Projects Approved

- R&D on large area GEMs for the ALICE TPC upgrade (GSI/ Tokyo / UNAM)
- High resolution UV scanner for MPGD applications (Wigner FCP/INFN Trieste/ INFN Bari )
- Large-area THGEM detector evaluation with SRS electronics (Weizmann/Coimbra/Aveiro)

## 2011: 4 Projects Approved

- Thin and high-pitch laser-etched mesh manufacturing and bulking (Saclay / CERN / Bari)
- Development of innovative resistive GEM alpha detectors for earthquakes prediction and homeland security (INFN Bari / UNAM, Mexico / INFN Padova / INFN Frascati)
- MPGDs technology laboratory for training, development, fabrication, applications and innovation (Universidad Antonio Nariño, Columbia / Brookhaven National Laboratory/ Helsinki Institute of Physics / HEPtech / GSI Helmholtzzentrum)
- A low mass microbulk with real XY strips structure (NCSR Demokritos / Saclay/ Laboratorio de Física Nuclear y Astropartículas, Universidad de Zaragoza / CERN )

**Management Board reviewed and proposed changes to the Common Project Submission and Evaluation Procedures**

**→ see talk A. White in the RD51 Plenary Session today**

**→ New Call for 2014 Common Projects is ready to go**



# RD51 Collaboration Notes

<https://espace.cern.ch/test-RD51/RD51%20internal%20notes/Forms/AllItems.aspx>

## RD51 INTERNAL NOTES

### 2011

**RD51-Note-2011-017** - "Transport properties of operational gas mixtures used at LHC" (by Y. Assran, A. Sharma)

**RD51-Note-2011-016** - "THGEM-based detectors for s laboratory and beam evaluation" (by L. Arazi, H. Natal da R. Azevedo, A. Rubin, M. Cortesi, D. S. Covita, C. A. B. Oli Park, J. Yu, R. Chechik, J. M. F. dos Santos, M. Breidenbac A. Veloso, A. Breskin)

**RD51-Note-2011-015** - "Detection and removal of short M. Kalliokoski, T. Hildén, R. Lauhakangas, P. Karppinen, T Garcia, J. Heino and E. Tuominen)

**RD51-Note-2011-014** - "Optical Scanning System for Qu (by M. Kalliokoski, T. Hilden, F. Garcia, J. Heino, R. Lauhaka Turpeinen)

**RD51-Note-2011-013** - "Test beam results of the GE1/1 upgrade of the CMS high-eta muon system" (by D. Abbaneo, M. Abbrescia, C. Armagnaud, P. Aspell, Y. Ban, S. Bally, L. Benussi, U. Berzano, S. Bianco, J. Bos, K. Bunkowski, J. Cai, J. P. Chatelain, J. Christiansen, S. Colafranceschi, A. Colaleo, A. Conde Garcia, E. David, G. de Robertis, R. De Oliveira, S. Duarte Pinto, S. Ferry, F. Formenti, L. Franconi, K. Gnanvo, A. Gutierrez, M. Hohlmann, P. E. Karchin, F. Loddo, G. Magazzu, M. Maggi, A. Marchioro, A. Marinov, K. Mehta, J. Merlin, A. Mohapatra, T. Moulik, M. V. Nemallapudi, S. Nuzzo, E. Oliveri, D. Piccolo, H. Postema, G. Raffone, A. Rodrigues, L. Ropelewski, G. Saviano, A. Sharma, M. J. Staib, H. Teng, M. Tytgat, S. A. Tuppiti, N. Turini, N. Smilkjovic, M. Villa, N. Zaganidis, M. Zientek)

**RD51-Note-2011-012** - "Construction and Performance of Large-Area Triple-GEM Prototypes for Future Upgrades of the CMS Forward Muon System" (by M. Tytgat, A. Marinov, N. Zaganidis, Y. Ban, J. Cai, H. Teng, A. Mohapatra, T. Moulik, M. Abbrescia, A. Colaleo, G. de Robertis, F. Loddo, M. Maggi, S. Nuzzo, S. A. Tuppiti, L. Benussi, S. Bianco, S. Colafranceschi, D. Piccolo, G. Raffone, G. Saviano, G. Magazzu, E. Olivieri, N. Turini, T. Fruboes, D. Abbaneo, C. Armagnaud, P. Aspell, S. Bally, U. Berzano, J. Bos, K. Bunkowski, J. P. Chatelain, J. Christiansen, A. Conde Garcia, E. David, R. De Oliveira, S. Duarte Pinto, S. Ferry, F. Formenti, L. Franconi, A. Marchioro, K. Mehta, J. Merlin, M. V. Nemallapudi, H. Postema, A. Rodrigues, L. Ropelewski, A. Sharma, N. Smilkjovic, M. Villa, M. Zientek, A. Gutierrez, P. E. Karchin, K. Gnanvo, M. Hohlmann, M. J. Staib)

**RD51-Note-2011-007** - "First observation of Cherenkov rings with a large area CsI-TGEM-based RICH prototype" (by V. Peskov, G. Bencze, A. Di Mauro, P. Martinengo, D. Mayani, L. Molnar, E. Nappi, G. Paic, N. Smirnov, H. Anand, I. Shukla)

**RD51-Note-2011-006** - "On the low-temperature performances of THGEM and THGEM/G-APD multipliers in gaseous and twophase Xe" (by A. Bondar, A. Buzulutskov, A. Grebenuk, E. Shemyakina, A. Sokolov, D. Akimov, I. Alexandrov and A. Breskin )

Modelling of avalanches and streamers by finite elements with de", Notes for the RD51 Simulation School, CERN, Jan. 19-21

Thermal Stretching of Large-Area GEM Foils Using an Infrared el Staib, Bryant Benson, Kondo Gnanvo, Marcus Hohlmann,

On the operation of a Micropattern Gaseous UV Photomultiplier val, A. Breskin, R. Budnik, W.T. Chen, H. Carduner, M. Cortesi, ird, J. Lamblin, P. Le Ray, E. Morteau, T. Oger, J.S. Stutzmann

Infrared scintillation yield in gaseous and liquid argon for rare-Buzulutskov, A. Bondar, A. Grebenuk)

**RD51-Note-2011-001** - "Further Developments and Tests of Microstrip Gas Counters with Resistive Electrodes" (by R. Oliveira, V. Peskov, Pietropaolo, P.Picchi).

### 2010

**RD51-Note-2010-009** - "Gas Flow Simulations for gaseous detectors" (by D. Abbaneo, S. Bally, H. Postema, A. Conde Garcia, J. P. Chatelain, G. Faber, L. Ropelewski, S. Duarte Pinto, G. Croci, M. Alfonsi, M. Van Stenis, A. Sharma, L. Benussi, S. Bianco, S. Colafranceschi, F. Fabbri, L. Passamonti, D. Piccolo, D. Pierluigi, A. Russo, G. Saviano, A. Marinov, N. Zaganidis, N. Turini, E. Oliveri, G. Magazzu, Y. Ban, H. Teng, J. Cai)

**RD51-Note-2010-008** - "Construction of the first full-size GEM-based prototype for the CMS high-eta muon system" (by D. Abbaneo, S. Bally, H. Postema, A. Conde Garcia, J. P. Chatelain, G. Faber, L. Ropelewski, S. Duarte Pinto, G. Croci, M. Alfonsi, M. Van Stenis, A. Sharma, L. Benussi, S. Bianco, S. Colafranceschi, F. Fabbri, L. Passamonti, D. Piccolo, D. Pierluigi, G. Raffone, A. Russo, G. Saviano, A. Marinov, M. Tytgat, N. Zaganidis, M. Hohlmann, K. Gnanvo, M.G. Bagliesi, R. Cecchi, N. Turini, E. Oliveri, G. Magazz`u, Y. Ban, H. Teng, J. Cai)

RD51 Notes: 8 in 2013  
12 in 2012  
17 in 2011;  
9 in 2010;  
7 in 2009

Please submit results of your work, in parallel with journal publication, as RD51 Note:

→ Efficient way to disseminate your results to the MPGD/RD51 community  
(rd51-all email goes to ~ 500 people)

# EU H2020 Discussion / MPGD Community Input

## Special RD51 Session on Thursday, 16:00 – 18:00:

→ Discuss participation of  
MPGD/RD51 groups in different  
EU Calls and Networks

→ Expression of Interest of the  
MPGD Community in AIDA2  
H2020

AIDA2 Town Hall Meeting  
(February 17, 2014 @ CERN):

[http://indico.cern.ch/conference  
Display.py?confId=289451](http://indico.cern.ch/conferenceDisplay.py?confId=289451)

## AIDA H2020 Open Meeting

Monday, 17 February 2014 from **10:00** to **17:30** (Europe/Zurich)  
at **CERN ( 222-R-001 - Filtration Plant )**

**Video Services** Vidyo public room : AIDA\_H2020\_Open\_Meeting [More Info](#) | [Join Now!](#)

Monday, 17 February 2014

- |               |  |
|---------------|--|
| 10:00 - 10:20 | Introduction + framework of IA Call 20'<br>Speaker: Laurent Serin (LAL-CNRS/IN2P3 Orsay(Fr))   |
| 10:30 - 10:50 | HL-LHC challenges and needs 20'<br>Speaker: Didier Claude Contardo (Universite Claude Bernard-Lyon I (FR))                                     |
| 10:55 - 11:10 | CLIC challenges detectors and needs 15'<br>Speaker: tba  |
| 11:15 - 11:30 | ILC detector challenges and needs 15'<br>Speaker: Juan Fuster Verdú (IFIC-Valencia (ES))   |
| 11:35 - 11:55 | Neutrinos challenges and detectors needs 20'<br>Speaker: tba   |
| 12:00 - 12:15 | CERN infrastructure improvements 15'<br>Speaker: Michael Moll (CERN)   |
| 12:20 - 12:35 | Irradiation facilities in Europe 15'<br>Speaker: Marko Mikuz (Jozef Stefan Institute (SI))   |
| 12:40 - 12:55 | Beam and detector testing facilities upgrade in Europe 15'<br>Speaker: Giovanni Mazzitelli (INFN)  |
| 13:00 - 14:00 | Lunch  |
| 14:00 - 14:15 | Involving industry in AIDA-2 15'<br>Speaker: tba   |
| 14:20 - 14:35 | Software activities in AIDA-2 15'<br>Speaker: Frank-Dieter Gaede (Deutsches Elektronen-Synchrotron (DE))                                       |
| 14:40 - 14:55 | 3D interconnection, Micro-cooling, Micro-electronics 15'<br>Speaker: Valerio Re (INFN)   |
| 15:00 - 15:15 | Infrastructure upgrade with pixels detectors 15'<br>Speaker: Anna Macchiolo (Max-Planck-Institut fuer Physik (Werner-Heisenberg-Institut) (D)) |
| 15:20 - 15:35 | Infrastructure upgrade for Silicon detectors 15'<br>Speaker: Thomas Bergauer (Austrian Academy of Sciences (AT))                               |
| 15:40 - 15:55 | Infrastructure upgrade with gaseous detectors 15'<br>Speaker: Klaus Desch (University of Bonn)   |
| 16:00 - 16:15 | Infrastructure upgrade with calorimeters 15'<br>Speaker: Felix Sefkow (Deutsches Elektronen-Synchrotron (DE))                                  |
| 16:20 - 16:35 | DAQ/online activities in AIDA-2 15'<br>Speaker: David Cussans (University of Bristol (GB))   |
| 16:40 - 16:55 | Other potential common topics for AIDA-2 / Nor covered EoIs 15'<br>Speaker: tba  |
| 17:00 - 17:30 | Discussion / Next steps 30'  |



# WG5 – Scalable Readout Systems Status Overview 2013 / 2014

## • SRS production 1Q 2013... Feb 2014

	stock	delivered	value kFS	comment
<b>CERN –store stock sales 1 Q 2013</b> FEC cards ADC cards Minicrate Eurocrate APV hybrids 	25 25 10 15 400	25 25 10 15 400	37.5 27.5 7.5 12 55k	$\Sigma$ 140k Hybrid SA
<b>CERN-store re-orders @ PRISMA</b> FEC cards ADC cards ATX adapters Minicrate Eurocrate 	ordered 60 59 15 45 15	delivered 54 51 15 14 0	value kFS 90 70 4 33.5 12	$\Sigma$ 200k comment quality issues quality issues awaited awaited
<b>RD51 SRS upgrade</b> new FEC cards V6 	Ordered 4 8	delivered 4 protos 0	value kFS 6 12	$\Sigma$ 18k -10k already spent comment UPV test order 8 pending
<b>CERN-store orders @ NEOHM</b> APV hybrids 	ordered 500	delivered 10 protos	value kFS 70	$\Sigma$ 70k comment in production
<b>ORNL/RD51 orders @ NEOHM</b> Beetle hybrids 	4	4 protos	value kFS 5	$\Sigma$ 5k in production
<b>ALICE/RD51 orders @ TELSA</b> SRU's RD51 SRU's ALICE PHOS Digital cards ALICE /ITS  	ordered 4 16 0	delivered 0 0 0	value kFS 10 40 10	$\Sigma$ 60k awaited awaited Alice order 10

[ 8k request RD51 for items in red ]

# WG5 – NEW Scalable Readout Systems (EicSys/ATCA)

## New SRS in 2014

### EicSys orders/ATCA 2 slot crate

IFIN-HH  
UPV Valenci:  
ORNL/ALICE  
ATLAS NSW



ordered	delivered	value	kFs	comment
1	1	17		proto
	0	17		awaited
	1	17		shipped
	1	17	$\Sigma$ 70k	@ CERN

- New cards SRS -ATCA  
RTM 10 Gbit



Target date	Dev. cost	kFs	Comment
Aug 14	10	$\Sigma$ 10k	UoV

### Auxiliary SRS cards & Boxes

Proto versions

dev. Cost kFs

comment

- APV
- Femto Box
- GHz pre-amplifier



3	5		+2 k Rev 4 /RD51
2	3		+2 k Rev 3 /RD51
1	2	$\Sigma$ 10k	+2k Rev 2/RD51

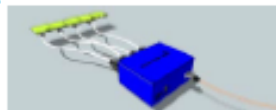
### NEW R&D SRS electronics 2014

Target date

dev. cost kFs

comment

- VMM hybrid 128 ch
- OC fiber/copper box



June 14	16		RD51/IFIN-HH
June 13	14	$\Sigma$ 30k	ATLAS NSW/UoV

[ 22 k request RD51 for items in red ]



# WG5 – Electronics & Scalable Readout Systems

**Legal documents required for SRS distribution to the RD51 institutes are finalized**

**Caveat:** situation only resolved for countries, which does not require license, based on “Commerce Control List” (cat. NS2) – mostly Europe, Switzerland & few others

Institute Name  
[Street Address] • [City], [Postal Code]  
Phone: [Your Phone] • Fax: [Your Fax] • E-Mail: [Your E-Mail]  
Web: [Web Address]

Date: [Insert Date]

CERN  
The European Organization for Nuclear Research  
Attention: Philippe Faithouat  
Cc: Alessandro Marchioro  
PH-ESE  
CH 1211 Geneva 23  
Switzerland

SUBJECT: Letter of Compliance Concerning Deep-Submicron Technology Circuits

Dear Sirs,

As an authorized representative of [Institute Name], I herewith confirm that [Institute Name] understands and agrees to comply with the provisions listed hereunder governing any and all integrated circuits manufactured in Deep-Submicron technology and made available to us by or on behalf of CERN (“the circuits”):

(1) Notwithstanding any other agreement or understanding entered into by [Institute Name], The [Institute Name] assumes responsibility in full for any loss, damage, fine or penalty incurred as a result of its failure to comply with these provisions;

(2) The [Institute Name] shall use the circuits exclusively for scientific research purposes and shall not transfer or (re)sell them for any other purpose;

(3) The [Institute Name] shall not cause the circuits to meet or exceed all (that is, cumulative) five of the following characteristics:

(a) a total dose of  $5 \times 10^3$  Rads (Si);

(b) a dose rate upset threshold of  $5 \times 10^3$  Rads (Si)/sec;

(c) a neutron dose of  $1 \times 10^{16}$  n/cm<sup>2</sup> (1 MeV equivalent);

(d) a single event upset rate of  $1 \times 10^{-10}$  errors/bit-day or less, for the CREME96 geosynchronous orbit, Solar Minimum Environment;

(e) single event latch-up free and having a dose rate latch-up threshold of  $5 \times 10^3$  Rads (Si).

## SRS Distribution Procedure;

➤ Every institute has to sign “Letter of Compliance” with RD51 spokes and send original to A. Marchioro

➤ Order your SRS systems/hybrids from CERN Store

➤ Pick-up hybrids from A. Marchioro office ([PH-ESE-ME, 77319](#))

# WG7 – Test Beams

## 2014 SPS North Area Test beam

### Very Preliminary schedule

Beam availability for rd51 as  
main user (H4):  
*16 days*

Period:

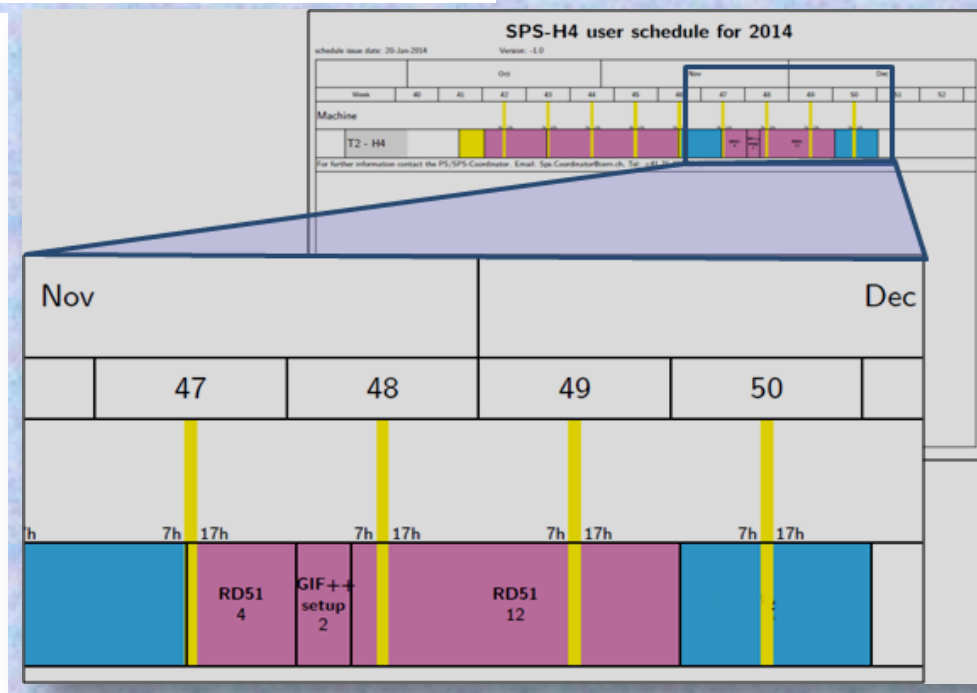
*End of November,  
Beginning of December*

### **13th RD51 Collaboration Meeting**

### **WG7 - Common facilities**

**Thursday, 6 February 2014 15:45 - 16:15**

- Overview of the facility and of the available services (for new users).
- Brief discussion about the preliminary schedule and the options provided by the SPS coordinator in view of the final schedule.
- Specific requests from the users that have expressed interest on participating to our really-welcome-2014-test-beam (electronics, trackers, magnet,...).
- aob





# RD51 Roadmap: Creating New Projects and Continuing Earlier Ones...

- ❖ Continuation of the R&D support for the experiments in many domains (...), and LHC upgrades, in particular **(WG1)**;
- ❖ Generic R&D (new structures/ideas, det. physics) – RD51 Common Projects **(WG2)**  
Development of new structure and consolidation of the existing structures
- ❖ Applications – organization of series of specialized workshops disseminating MPGD applications beyond fundamental physics – RD51 research + industry + potential users **(WG3)**
- ❖ Development and Maintenance of Software & Simulation Tools; basic studies & software support for the RD51 community **(WG4)**
- ❖ Development and Maintenance of the SRS Electronics **(WG5)**  
An extended support for the SRS including new developments and implementation of additional features ...
- ❖ MPGD Industrialization and QA Control – GEM, Micromegas, THGEM **(WG6)**;  
Completion of the industrialization of main technologies (GEM, MM, THGEM)
- ❖ Maintenance and extension of the RD51 lab and Test-Beam Infrastructure **(WG7)**
- ❖ MPGD Education and Training: organization of schools for students and newcomers & academic Training **(NEW WG)**

# **13<sup>th</sup> RD51 Collaboration Meeting (Feb. 5-7, 2014)**

**<https://indico.cern.ch/conferenceOtherViews.py?view=standard&confid=283108>**

## **Wednesday, February 5 (30-7-018 - Kjell Johnsen Auditorium)**

**10:00 – 12:00 RD51 Collaboration Board Meeting**

**13:00 – 15:00 RD51 Collaboration Plenary session**

**15:00 - 19:00 WG4 Software**

## **Thursday, February 6 (30-7-018 - Kjell Johnsen Auditorium)**

**09:00 – 13:00 WG1 MPGD Technologies and New Structures**

**14:00 – 15:45 WG6 Production**

**15:45 - 16:15 WG7 Test Beams**

**16:15 - 18:00 EU H2020 Discussion / MPGD Community Input**

**20:00 - 23:00 RD51 Collaboration Dinner (let us know if you are interested)**

## **Friday, Friday 7 (30-7-018 - Kjell Johnsen Auditorium)**

**09:00 – 13:00 WG5 Electronics**

**14:00 - 17:00 WG2 Physics Issues**