

# DRD1 WG 8

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## Training and Dissemination

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Thank you to others for survey comments, discussion and input to this presentation!

DRD1 Community Meeting

March 2, 2023

# Content

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- Topics covered by WG8
- Summary of survey
- Support of (young) researcher careers
- Existing training activities and initiatives
- Potential activities in context of DRD1
- Synergies and common aspects between technologies

# Topics covered by WG8

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- Schools and trainings
  - Schools for young researchers
  - Technical training opportunities
- Topical workshops
- Knowledge and technology transfer
- Supporting and promoting researcher careers
  - Opportunities for young researches
  - Strategies to recognize and sustain the careers of R&D experts
  - Retaining experts in the field
- Outreach

# Results of the Survey - WG8

DRD1 Community Meeting  
March 2, 2023

# Training and Dissemination

*Activities your group could be interested in:*  
(total 69 answers)

- **Groups interested in attending training/dissemination**

- 56 schools & training
- 50 topical workshops
- 29 knowledge transfer

- **Training and dissemination target**

- 47 BsC & MsC
- 54 PhD
- 46 Postdocs
- 28 Seniors

## 8. Training and dissemination

Training and dissemination Activities your group could be interested in

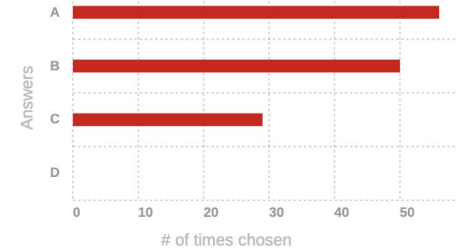
**Answer ed: 69** Please select where your team is involved. If not included in the list, please add them.

A. Schools and trainings: 56 (41.48%)

B. Topical workshops: 50 (37.04%)

C. Knowledge transfer: 29 (21.48%)

D. Other: 0 (0.00%)

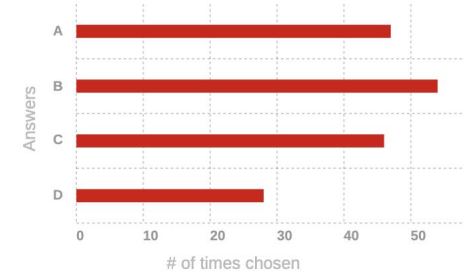


A. Bachelor and Master Students: 47 (26.86%)

B. Doctoral students: 54 (30.86%)

C. Postdoc: 46 (26.29%)

D. Senior: 28 (16.00%)



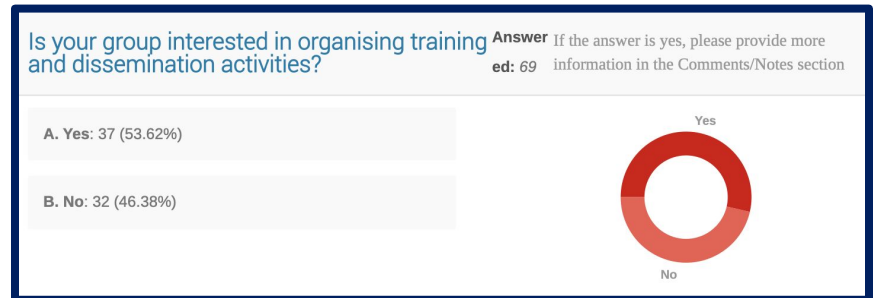
# Training and Dissemination - activities

List examples of existing or potential training and dissemination activities that you would like to have in the context of the DRD1 collaborations?

Answers can be grouped addressing the following main categories

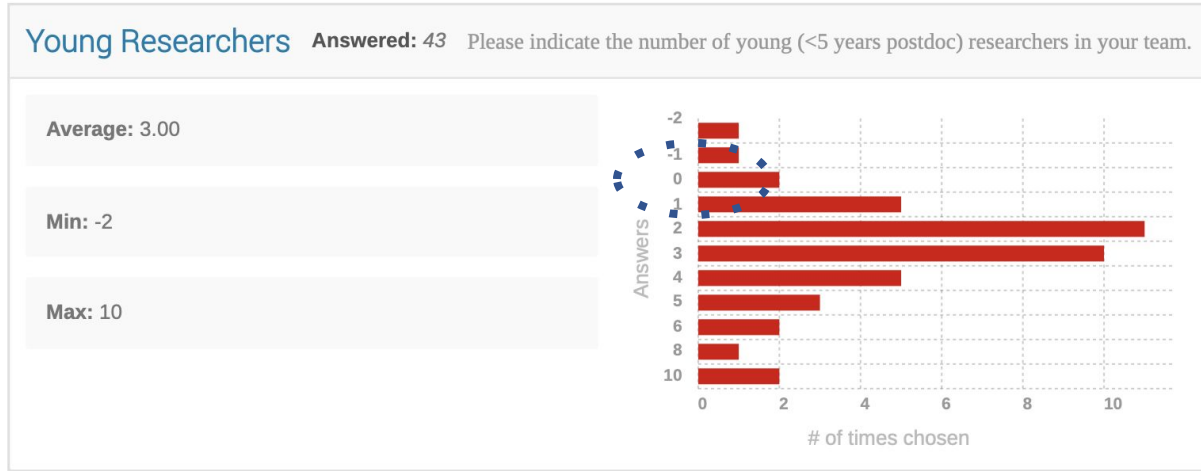
- **Detector Schools** (several references to existing RD51 initiatives, RPC, SNRI-INFN, ...)
  - Topics: Gas detector fundamentals; Assembly; Design; Readout; Gas detector common software/simulation tools; Materials; Gas properties; Ageing; discharges; Data analysis
  - Target: Young, as well as Senior; Training and dissemination are important at any stage of the career  
But also, for public engagement; first-year students  OUTREACH and EDUCATION
- **Topical Workshops and Lectures:** technology/application/tools (excellent example were the Lectures at CERN in 2019 on signals on particles detectors)
- **Training at Labs Institute Facilities**
- **Visiting Programs**

**37 groups interested in organising training and dissemination activities**



# Young Researcher – Current situation

Answers from 43 Institutes



**Average current number of young researcher in each group: 2-3**

**General issue: very difficult to engage young researches, especially in new avenues**

# Young Researcher Careers - General remarks (not from the survey)

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A few GENERAL REMARKS on the specificity of the physicists approaching R&D (and Detector Construction)

For a detector physicist reaching a good level of maturity could be a long path

- R&D work is:
  - intrinsically long, from the idea to the first working prototypes (finding materials/assembly techniques/read-out)
  - Risky: a lot is invested (from an economic and work point of view) but the results can be drastically negatives. Discovering the causes (whether of concept or method) to re-complete the exploratory path is not obvious
- Often linked to R&D there are needs from Experiments: Construction, Quality Control, Commissioning:
  - **construction phase:** very tiring, tight rhythms on production testing/quality control and certification, limited freedom of exploration, activity considered repetitive, and which does not require intellectual effort, therefore scarcely considered
  - **Commissioning and maintenance:** time consuming, high level of responsibility but poor visibility; long time to achieve the sensitivity to focus on critical points, risks, and to understand their potential



# Strategies to recognize and sustain the careers of R&D experts

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Grouping in top survey recommendations

## Proposals of what can be done within DRD1

- Leadership roles within DRD1
- Young (experienced) researcher awards on R&D by DRD1
- Speakers on behalf of DRD1 at International Conferences
- Advertise within DRD1 webpages (and tools in general: several references to existing RD51 initiatives, RPC, SNRI-INFN, ...)
  - Job openings in R&D;
  - experts potentially available for possible jobs/opened positions;
  - availability of training periods in the DRD1 Labs;
  - share of resources (forum to connect people with specific knowledge)
- (Common) Project fundings for young researchers within DRD1
- New career development opportunities through expanded collaborative networks, training events such as summer schools and workshops and DRD1 visiting scientist programs

# Strategies to recognize and sustain the careers of R&D experts

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Grouping in top survey recommendations

Proposals that depends on national/institutional/laboratories policies

- PhD thesis fully dedicated to detector developments
- Academic positions for courses on detector developments or for longer term contract
- Correct evaluation of detector-dedicated activities in CVs (i.e., Change the mind of funding agencies and University/ Institutions regarding the value of R&D versus analyses)
- Gas detectors activities in University courses
- Trainings on how writing CVs, interviews to valorise experience
- Engaging trainee student in the development of detectors, as they evolve to achieve their undergraduate/diploma/phd degree. It has been found to increase success in getting a position
- Responsibility roles for R&D within collaborations

# Existing training activities and experience

# Existing experience, activities and initiatives

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## Schools

examples from RD51: <https://rd51-public.web.cern.ch/meetings-workshops>

- Open Lectures
- RD51 Electronics School
- RD51 Simulation School
- Organising RD51 MPGD School (Nov 27 - Dec 1, 2023): <https://indico.cern.ch/event/1239595/>
  
- Well received with good attendance
- Generally no fee and open access to materials
- Important collection of resources and references
  
- Other instrumentation schools
  - Promote participation, link by lecturers/tutors, participation with laboratories...
  - ESIPAP, ISOTDAQ, Swieca School, ...

# Existing experience, activities and initiatives

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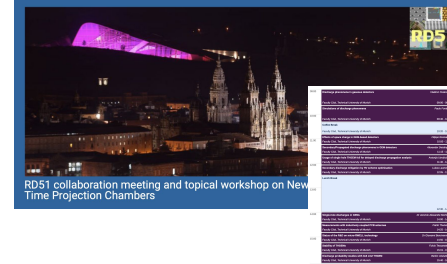
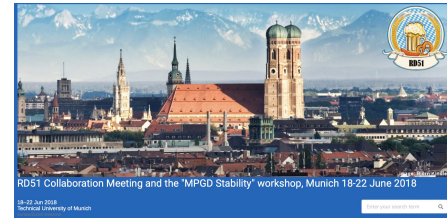
## Training Events

- Hand-on trainings about straw assembly and techniques
- Exchange of technical drawings, info about suppliers, ... to facilitate new straw detector projects (possible to organise when production is ongoing, hard for smaller groups / in view of time-limitations / temporary personnel)
- MPGD training events: GEM and Micromegas detector design and assembly training ([GEM detector design: Lecture session](#) / [Micromegas detector design: Lecture session](#))

# Existing experience, activities and initiatives

## Topical workshops

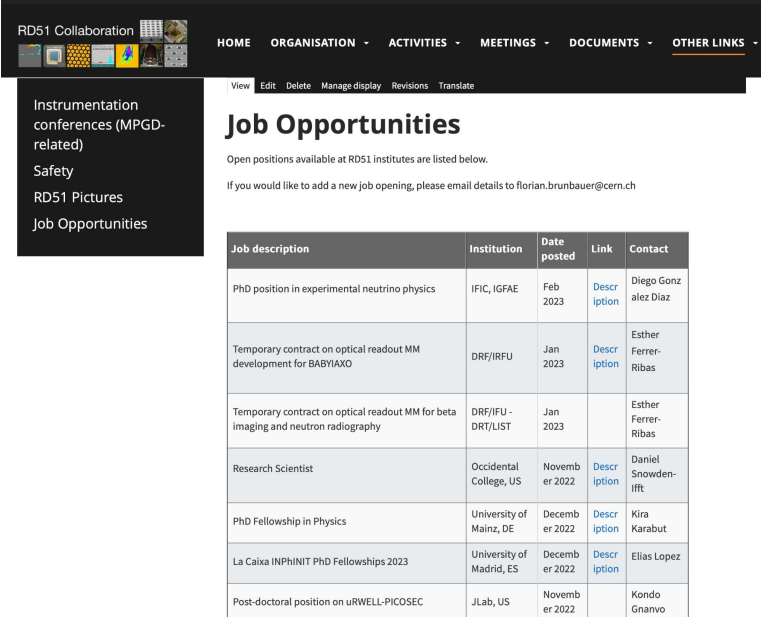
- 1-2 day events in combination of other meetings
  - (e.g. in same week as RD51 collaboration meetings)
- Stand-alone workshops of several days / week-long
  - Biennial itinerant workshop covering several common issues in RPCs (large muon systems, electronics, applications) but open to other topics, see:  
RPC 2020: <https://agenda.infn.it/event/19942/timetable/#20200210>  
RPC 2022: <https://indico.cern.ch/event/1123140/>
- Forum for discussions on a common challenge (e.g. stability, ageing, wide dynamic range) or interest (TPCs, FE electronics, negative ion drift, ...)



# Existing experience, activities and initiatives

## Job opportunities

- Circulating job opportunities via mailing list
- Listings on webpage: <https://rd51-public.web.cern.ch/jobs>



The screenshot shows the RD51 Collaboration website. The navigation bar includes links for HOME, ORGANISATION, ACTIVITIES, MEETINGS, DOCUMENTS, and OTHER LINKS. A sidebar on the left contains links for Instrumentation conferences (MPGD-related), Safety, RD51 Pictures, and Job Opportunities. The main content area is titled "Job Opportunities" and includes a sub-header "Open positions available at RD51 institutes are listed below." and a note: "If you would like to add a new job opening, please email details to florian.brunbauer@cern.ch". Below this is a table listing various job openings.

Job description	Institution	Date posted	Link	Contact
PhD position in experimental neutrino physics	IFIC, IGFAE	Feb 2023	<a href="#">Description</a>	Diego Gonzalez Diaz
Temporary contract on optical readout MM development for BABYIAXO	DRF/IRFU	Jan 2023	<a href="#">Description</a>	Esther Ferrer-Ribas
Temporary contract on optical readout MM for beta imaging and neutron radiography	DRF/IFU - DRT/LIST	Jan 2023		Esther Ferrer-Ribas
Research Scientist	Occidental College, US	November 2022	<a href="#">Description</a>	Daniel Snowden-Ifft
PhD Fellowship in Physics	University of Mainz, DE	December 2022	<a href="#">Description</a>	Kira Karabut
La Caixa INPHINIT PhD Fellowships 2023	University of Madrid, ES	December 2022	<a href="#">Description</a>	Elias Lopez
Post-doctoral position on uRWELL-PICOSEC	JLab, US	November 2022		Kondo Gnarvo

# Potential WG8 activities and synergies between technologies and WGs

DRD1 Community Meeting  
March 2, 2023



# DRD1 | WG8

## ECFA GSR 8:

Attract, nurture, recognise and sustain the careers of R&D experts

## DRD1 Implementation

- to help in the education and training, for cross-fertilization among different particle physics (and neighboring discipline) detector development programs.
- to promote the visibility and prospects of young researchers in detector technologies.

## Training and Dissemination

- DRD1 WG8
- ECFA TF9
  - No plan for dedicated “DRD9 / Training collaboration”
  - Community meeting in spring - register for updates : <https://indico.cern.ch/event/1214429/>
  - Initiatives to promote career opportunities, recognition of instrumentation work

### Towards a DRD1 Structure and proposal

Strong link with General Strategic Recommendation (GSR) reported in the Roadmap document

**GSR 8 - Attract, nurture, recognise and sustain the careers of R&D experts**

...continues the study of **recognition with a view to consolidate the route to an adequate number of positions with a sustained career in instrumentation R&D** to realise the strategic aspirations expressed in the EPPSU....

Consideration needs to be given to creating sufficiently attractive remuneration packages to retain those with key skills which typically command much higher salaries outside academic research.

#### WG8: Training and dissemination

- Schools and trainings
- Topical workshops
- Knowledge transfer
- ( Young ) Researcher Career
- Strategies to recognize and sustain the careers of R&D experts

# Common challenges

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Shared challenges between gaseous detector technologies and more generally in field of detector R&D

- Career development
  - **Keeping experts in field of gaseous detectors**
  - Attracting and retaining young researchers as well as recognition of experimental work
  - Recognise and support young researcher careers
- Training
  - Training and exchange of experience on topics of common interest (gases and materials, simulation techniques, electronics, ...)
- Attracting future instrumentalists
  - University courses
  - Outreach

# Potential activities in context of DRD1

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- **Training events** (not limited to students) that expose people to other gaseous detector technologies
  - Schools
    - DRD1 Gaseous Detector School ?
    - Technology-specific schools (continuation/creation) ?
  - Technical training courses
- Listing of **job opportunities** - sharing job-postings with mailing list
  - Informed by community, maintained by volunteer / WG8 convenors
- Database of **expert contacts** for specific topics
  - Volunteer experts who are open to share relevant resources and contacts
  - Can act as entry point for identifying existing experience in the collaboration
- **Collection of resources** and documentation
  - “Handbook” on common techniques, instrumentation, lab activities similar to “Gaseous Detector Handbook” by F. Sauli (<http://fabio.home.cern.ch/fabio/handbook.html>)

# Potential activities in context of DRD1

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## Topical workshops

- Link different technologies by exchanging knowledge on common challenges
  - Workshops dedicated to single technology
  - Workshops dedicated to topic common among technologies
- Organisation
  - Regular workshops in DRD1 meetings - suggesting/selecting topics by convenors
  - Proposing workshops by members of community based on their research interested and organisation by them
  - “Guest-convernorship” of working group sessions in meetings
  - Differentiation between (wide) collaboration meetings and technical meetings?
- Challenges
  - Careful consideration of scope to promote technical discussions (narrows) while exchanging experience between communities (wide)
  - Give space to young researchers to share their work with experienced audience
  - Terminology: consider effect of labels like “workshop” vs. “conference” in view of career / evaluations

# Potential contributions by DRD1 WG8

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## Education

Laboratory activities are crucial part of physics education for young students.

They help in learning experimental techniques and builds teamwork and collaboration skills. These skills are essential for success in physics and other scientific fields.

- Ensuring high quality educational Lab activities focusing on Gas Detectors should be among the scopes of DRD1 WG8
  - Share experience, distribute knowledge
  - Schools for students and for teachers
  - Seminars and Tutorials
  - Construction of simple setups /demos – development of portable or closed gas systems

# Potential contributions by DRD1 WG8

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## Outreach

Outreach is a crucial tool for attracting students to physics research and ensuring that the field remains diverse and inclusive.

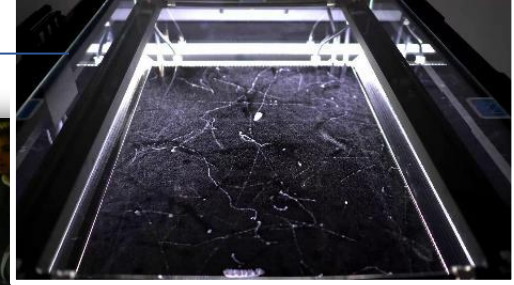
- Must help to dispel misconceptions about physics being too difficult or abstract show the practical applications of physics research.
- Providing opportunities for students to learn about and engage with physics research, outreach programs can help to inspire the next generation of physicists
- Outreach can also provide opportunities for students to engage with researchers, ask questions, and get hands-on experience with physics concepts and tools

# Outreach - excellent examples

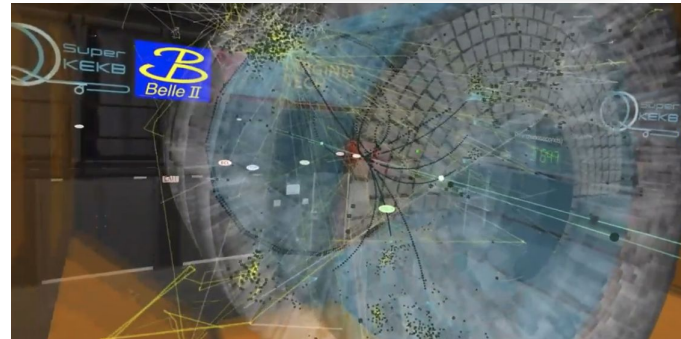
- MASTERCLASS, Laboratory visits, CERN OPEN Days
- European Researchers' Night
- Internships and Summer Schools, short-term training programs in which students can work in the laboratory under the guidance of experienced researchers and learn basic research techniques
- Mentoring and tutoring programs, in which students can be paired with researchers to deepen their scientific knowledge and develop their skills

DRD1 WG8 can help to

- Promote events/experience
- share knowledge, tools, experimental setups, methods, common demonstrator setups, ...



European Researchers' night



Virtual reality

# Potential of WG8 in DRD1

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## Exchange of experience between communities

- Schools and training events open to all can serve to share knowledge
- Interest of training events also for **senior researches** to be exposed to other gaseous detector technologies
- **Training events for technicians** (motivating detector designs and sharing technical experience - materials, mechanics, support structures, ...)
- Research **visits** to institutes with ongoing **detector production** cycles for training
- **Summer student projects** focused on common needs and activities (electronics and instrumentation, simulation tools, common test facilities)

## Links to other DRD1 WGs

- Training/knowledge sharing events organised together with other WG convenors - some examples:
- WG4 - Simulation School, exchange of educative materials on simulations
- WG5 - Courses/training on common readout electronics (SRS) and gas detector R&D instrumentation
- WG6 - Technology transfer to industry - training courses, industry contacts, exchange experiences
- WG7 - Common facilities are great opportunity for training and exchange, dedicated courses on e.g. “test-beam operations”



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Common training events / schools linking technologies?

Technical training courses linked to common facilities?

Wide or narrow topical workshops in DRD1 meetings?

Awards / prizes / recognition of young researcher activities?

Common listing of job opportunities - website/ mailing list?

Database of “experts” to share contacts and resources?

Roles in DRD1 for young researchers?

Promote common project funding for young researchers?

Compilation and maintenance of “handbook”  
on R&D instrumentation and techniques?