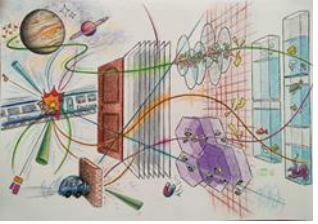
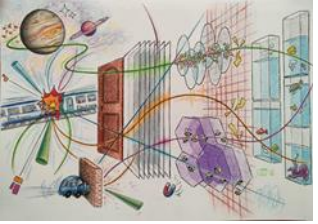


Steps to setting up DRD3 collaboration

suggestions for the discussion

G. Kramberger

on behalf of the DRD3 preparation team



Timeline as given by SPC (meeting 26-27.9.2022)

DRD3

Q4-2022/Q1-2023

- Formation of the DRD3 proposal team
- Collection of interest from the institutes
- Preparation of this workshop and shaping the direction of RD.
- DRDC mandate reviewed and agreed with CERN management and EDP – members appointment begin.

Q2-2023

- Writing the scientific proposal (~20 pages) that includes conclusions/feedback feedback from the workshop and questionnaires
- Mechanisms agreed with funding agencies for country specific DRD funding request.

Q3-2023

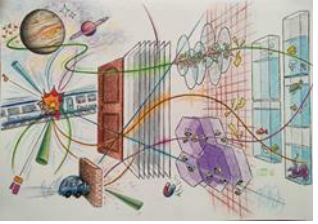
July – submission of the costed proposal:

- resources needed and resources already available
- who covers what (pledges by the institutes/FA)
- DRDC review (scientific, milestones, feasibility, financials)

Q4-2023

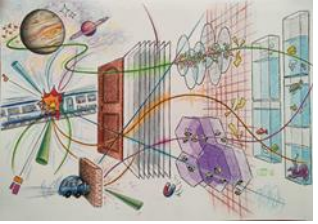
- Establishing continuation of existing RD50 projects and carrying resources.
- Follow the review revisions and upon green light from DRDC, CERN research board **approves the formation of the collaboration**

If we want to start DRD3 in 2024 we need to design the road-map of how the organization of the collaboration should look like – pave the road to setting up the collaboration.



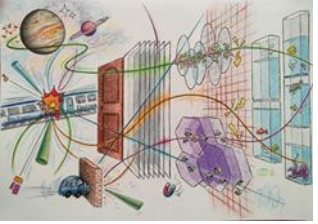
DRD3 community driven collaboration

- Everything in matters of collaboration is decided and run by the collaboration (including the structure of the work)
- Organization of the work will be up to the collaboration. We propose a reasonable number of work groups dedicated to specific topic of research.
- **Work group (research line)** – is a platform addressing closely linked activities:
  - Will take care (supervise/advise/facilitate)
    - **Work package** (**strategic R&D to which the funding agencies will commit – to be included in the addendums of MoU**)
    - **Common projects** (also generic R&D, blue sky)
    - **Collaboration with Experiments** (including physics studies related to sensors)
  - Look into the future R&D needs
  - Exploit and use synergies with other WGs/DRDs
- Work groups will be the core of the collaboration and will be coordinated by the convener(s)
- The collaboration will be steered by the (standard scheme):
  - Collaboration board – including a representative from each participating institution
  - Spokesperson(s)



Strategic R&D = Work Package

- The talks in each country should start discussing DRD3 proposal on **strategic R&D** – is it very likely that financing structure and commitments in the MoU will be different from country to country. A help from ECFA can be/is expected.
- Strategic R&D
  - should pursue implementation of the milestones and deliverables and execute the workplan outlined in the approved scientific proposal and implemented in the addendums to MoU.
  - funds for the strategic R&D comes from FA **and is held with institutes working on the WP**. The strategic R&D will be in the focus of the DRDC reviews.
  - every WG should take part in WP. WPs are expected to benefit from the synergies with other WG, Common Projects and common infrastructure.



Committees (IP, speakers, reporting, resources, DRD syn. …)

Collaboration board (CB chair, deputy chair)

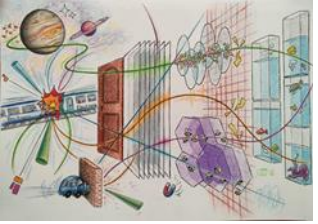
DRD3

Administration

Spokespersons (& deputies)

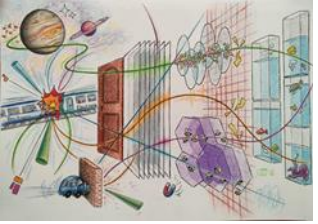
DRDC (ECFA-CERN)

WG 1 (DRDT3.1) Monolithic CMOS sensors	WG 2 (DRDT3.2) Sensors for tracking and Calorimetry with space/time and/or energy resolution	WG 3 (DRDT3.3) Radiation damage and ultra high fluences	WG 4 (DRDT3.x) Simulations	WG 5 (DRDT3.x) New Characterization Methods, Techniques and Infrastructures	WG 6 (DRDT3.3) Non-silicon semiconductor and other material studies	WG 7 (DRDT3.4) Interconnect and device Fabrication technologies	WG 8 Dissemination and outreach
• Investigate Monolithic Active Pixel Sensors (MAPS) than may achieve very high spatial • resolution and very low mass. • Understand radiation hardness limits of MAPS. • Investigate the use of State-of-the-art commercial CMOS in tracking and vertex detectors. • Explore the use of passive CMOS as a complement to standard sensors.	• Develop ultra-fast detectors, enabling 4D tracking to deal with multiple interactions occurring within a bunch crossing (pile-up). • Understand the ultimate limit of precision timing in sensors, with and without internal multiplication. • Investigate new semiconductor and technology processes with faster signal development and low noise readout properties.	• Undestrand microscopic properties of detectors at extreme fluences. • Understand the limit of semiconductors at high fluences. • Study innovative materials • Charachterization of defects in semiconductors	• Verify and prepare the TCAD tools for use in various DRDTs • Improve and develop MC tools • Develop and implement new radiation hardness models and device parametrizations • Design common tools for data processing (digitization, electronics)	• Explore the use of new techniques to characterize detectors • Develop common DAQ tools • Irradiation facilities, including extreme fluences. • Test beams • IBIC studies	• Understand the detailes of the damage of the WBG semicondcuntos • Develop methods for characterization and fabrication of detectors from innovative materials	• Advanced Integration Technologies. • Process capabilities for different wafer sizes and sensor material types. • Alternative bonding technologies for ultra-thin wafers. • Reduction of interconnection pitches	• Participation in congress • Explore other applications (Nuclear physics, Astrophysics, Fusion) • Contact industrial partners. • Participation in EU or similar funding projects • Website



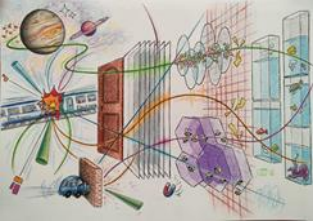
General Strategic Recommendations

- GSR 1 - Supporting R&D facilities - **WG5**
- GSR 2 - Engineering support for detector R&D – **WG5,7**
- GSR 3 - Specific software for instrumentation - WG4
- GSR 4 - International coordination and organization of R&D activities – **DRD3**
- GSR 5 - Distributed R&D activities with centralized facilities – **WG4,5,7**
- GSR 6 - Establish long-term strategic funding programs – **DRD3**
- GSR 7 - Blue-sky R&D - **Common Projects**
- GSR 8 - Attract, nurture, recognize, and sustain the careers of R&D experts – **WG8**
- GSR 9 - Industrial partnerships – **WG1,5,7**
- GSR 10 - Open Science – **DRD3**



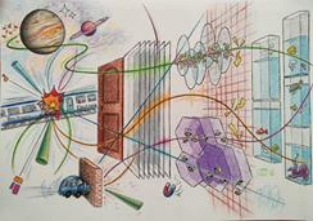
Steps to the DRD3 (I)

- Writing of the proposal – please send the comments to milestones/deliveries/costing to DRD3 preparation team to be implemented already in the draft of the proposal (**end of April 2023**)
- Circulation of the proposal draft (**May 2023**)
- Submission of the proposal to DRDC (**July 2023**)
- Formation of the “electoral/administrative” Collaboration Board **(July 2023)**
  - each institute will be requested to submit the name of the institute representative with a voting right in the “ provisional ” CB (Can we agree at this meeting that submitted contact persons are already members of the “provisional” CB?)
  - Institutes’ representatives will submit the list of people involved (collaboration members) – informative nature
  - the provisional CB role will be mostly/only electoral



Steps to the DRD3 (II)

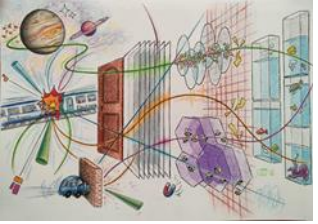
- Institutes taking part in certain DRD3 activity will nominate the work group/research line conveners for that WG **(September 2023)**
  - DRD3 proposal team should not served as a search committee (collision of interests)
  - DRD3 proposal team will perform elections of the WG conveners (how many per WG?) from the proposed candidates **(October 2023)**
  - Only institutes contributing to the working group will be eligible to vote (procedure to be agreed)
- DRD3 proposal team will serve as a search committee for the Collaboration Board Chair **(November 2023)**
- WG conveners will serve as a search committee for spokespersons candidates **(November 2023)**
  - candidates will be asked to prepare the presentation (vision/structure/organization…)



Steps to the DRD3 (kick-off meeting)

DRD3

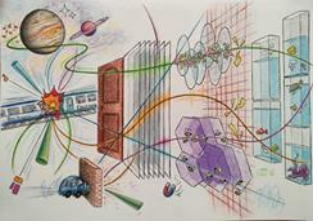
- Kick-off collaboration workshop/meeting will be organized by the DRD3 proposal team which **will mark the end of the DRD proposal team mandate (January 2024).**
- structure of the workshop/program will be prepared by the WG conveners
- CB will have inaugural meeting with the first task “election of the CB chair” (procedure to be agreed).
- CB chair appoints his/her deputy, who need be endorsed by the CB at the next meeting.
- CB chair runs the elections of the spokesperson(s). The list of candidates, prepared by the search committee, will be presented to the community and discussed at the kick off week/workshop/meeting – candidates will be asked to present their bids.
- CB will hold elections of the spokespersons (procedure to be agreed).
- Each spokesperson will appoint his deputy which has to be endorsed by the CB by the next meeting.



Steps to the DRD3 (organization)

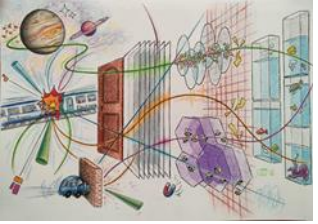
The DRD3 management: spokespersons, deputies, CB-chair, WG conveners will (by the 2nd Workshop/meeting?):

- Prepare the MoU (**DRD3 proposal team advises to follow as close as possible the RD50 one**) with detailed description DRD3 functioning
- Organize:
  - Administrative support (budget holder, web site administrator, communication with other DRDs…)
  - Committees:
    - speakers committee
    - intellectual property committee?
    - resource committee?
  - Organize the transfer of RD50 funds to DRD3 and establish the procedures of running the funds. RD50 management reserves the right to take part in the organization of the transfer.



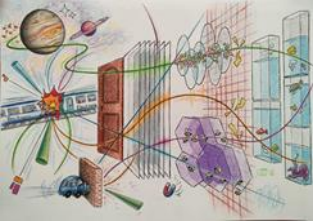
Rules of collaboration - MoU

- This is not the enforcement of the rules - it is an example of RD50 MoU
- The link to the RD50 MoU can be found http://cds.cern.ch/record/2670537
- RD50 lessons learned are:
  - it takes quite some time to prepare it – we should start early
  - reuse parts that were proven to work
  - make sure that legal part is in accordance with CERN rules – CERN based DRD should obey all the CERN rules
  - do it flexible so the annexes/addendums can be added without revision of the main document
- What is going to be different:
  - The MoU will have to be signed at the funding agency level (RD50 was more relaxed) for the strategic R&D.
  - Annex part must allow for different financing schemes for different funding agencies (that will be most likely the biggest challenge)
- What makes a collaboration strong and makes bonds between groups is fund for common projects financed by yearly fixed contribution from the groups. It is our advice to keep it.



RD50 experience – MoU Body

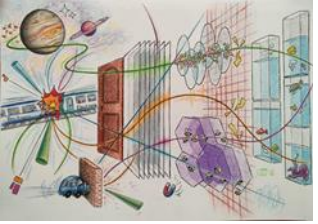
- Article 1: Parties to the MoU (CERN and Funding Agencies of the Collaboration, newly admitted Institutions shall sign this MoU)
- Article 2: Purpose of the MoU (RD program, organization of the collaboration, common infrastructure, Collaboration fund, IP and dispute resolution)
- Article 3: CERN's obligations – needs changes to include managerial/administrative part ….
- Article 4: Responsibilities of the Collaborating Institutions
- Article 5: Structure of the Collaboration:
  - Collaboration Board
  - Spokespersons – RD50 had two for 2 year term (maybe 4 year is more appropriate)
  - Research line conveners – appointed by spokesperson or by institutes involved in WG?
- Article 6: Common fund (rules of spending are in annex)
- Article 7: Intellectual property
- Article 8: Publications, Theses and Conference contributions
- Article 9: Observance of the MoU and the General Conditions
  - Note that MoU may not be legally binding.
- Article 10: Duration of MoU
- Article 11: Withdrawal of FA
- Article 12: Participation of additional institutions
- Article 13: Industrial partners
- Article 14: Relations to Experiments
- Article 15: Amendments



RD50 experience – MoU Annexes

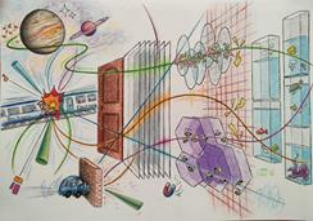
DRD3

- Annex 1 :List of collaborating Institutes (gets regularly updated)
- Annex 2: List of Funding Agencies of the Collaboration and their Representatives OR Responsible for MoU signatures
- Annex 3: Details on tasks and procedures of the Collaboration bodies responsible for its management (election rules for CB chair, spokespersons, conveners….)
- Annex 4: Current positions
- Annex 5: New Institutes joining, Industrial Partners, Observers and Relation to other Experiments (rules!)
- Annex 6: Contributions to the Common Fund for Common Projects/Administration
- Annex 7: General Conditions applicable to Experiments at CERN
- Annexes X:
  - **List of resources for given Workpackage/Strategic R&D that FAs will commit to (to be agreed and will take most of the effort)**
  - Financing of the infrastructure needed to run the collaboration (secretary, office, web manager)



Questions for the future collaboration? “Do we agree?” page.

- Time line – constrains from CERN/ECFA so we have little room to maneuver.
  - We plan to draft the DRD3 proposal (milestones/deliveries/costing) by the end of May so that all will have a month to review it. Send comments to presented material by the end of April.
- Procedure to setting up the collaboration – **magenta part of the previous slides**
  - contact persons are “provisional CB”
  - conveners nominated and elected by interesting groups
  - WG conveners are search committee for Spokespersons
  - CB chair election procedure (search committee and elections)
- MoU – based on RD50 with funding for “strategic R&D” in Annexes/Addendums.



DRD3

Thank you and it is time for discussion ...