

RDC10: Brief status report

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RDC10 - What has happened so far...

- Eric and Andy had multiple chats and formed action items:
 - Mirror Survey of CERN DRD for future DRD on Mechanics, very close discussion with mechanics people in Europe – drafted and about to be released these days
 - Focus on interest not so much on specific FTE & funding existing
 - Identify also capabilities and infrastructure, e.g. cooling plants, process equipment, etc.
 - Contact any and all mechanics institutes in the US to join the RDC10: Washington, Cornell, Purdue, LBNL, LANL, Fermilab, Amherst, Yale, and many more
 - Distributed to some in nuclear/EIC community: Spread the word...
 - Clear desire to broaden further: what about mechanics in neutrino, cooling, space ?
 - Kickoff RDC10 meeting likely timescale of early 2024
 - Intend to have monthly or bi-monthly meetings
 - Once established, we can discuss in our community on what the plans & goals can (?) or could (?) be...also related to what funding might become available or not.

Module/Sensor Mechanical performance is more aligned with other RDC,
RDC10 is more directed at 'detector supports' and integration/assembly

RDC10 - Community

- Mechanics is a very broad subject with differing requirements and impacts in several of the other RDC subjects
- Tracking Detectors represent the current cohort--the intention is to expand to include other technologies which may include Cryogenic, UHV, and of course Services (which are often overlooked)
- The Forum on Tracking Detector Mechanics is a recent good example of the goal here, which is to get experts and interested parties with similar or adjacent interests and challenges to communicate better and eventually coordinate and share R&D results
- A Survey will be circulated and can be filled out by individuals, groups, or organizations within institutions; ideally some coordination within an institution would be useful but not required

RDC10 - Community Expansion

- CPAD is mostly aligned with HEP Detectors which is already a broad field with varied technologies
- Adjacent Fields (and funding sources) will be encouraged to join, e.g. Nuclear Science, BES (Light Source), NSF colleagues
- Several current and future projects in these other fields/FA share technology (and likely personnel already)
- We are each funded uniquely, but we are not a funding source
- Space or Industry may be outside our wheelhouse, but will not be discouraged if interested in the future
- SC Magnets are a DRD in the CERN/ECFA planning--some ties between RDC10 and US MDP (Magnet Development Program) may prove beneficial (shared personnel may be sufficient)

RDC10 - Community Survey

This is an expression of interest not a proposal so FTE/Funding is not requested--will send a standard email request shortly with this basic information requested (suggestions for further information welcome!)

- Who you are--describe your group/institute
 - Add relevant personnel to RDC10 and perhaps indicate a POC if desired
- What are your/group's interests, e.g. current and future
 - Open format--can be R&D proposals, current/future detector projects,
 - Other RDC's that you or your group are interested/involved with
- R&D Proposals
 - Both what you think is important for the field and also ones you are interested in (Blue Sky!)
- DRD (CERN/ECFA) Collaboration
 - Do you have plans to collaborate with any CERN DRD programs and which ones
- Capabilities or Expertise
 - Open format, e.g. Partnerships with other departments or institutes or industry, access to various test or process equipment etc.
 - If desired summary of expertise, e.g. Composite Design/Fab, Machine shop, 3D Printing, UHV, Cryogenics, RF, FEA

This info will not become public. Can discuss at CPAD or RDC10 level if/how to share 'useful' information within the community e.g. who has what equipment/capability to enhance collaboration

RDC10 - Community Goals

- Establish a collaborative community in which R&D can be leveraged and enhanced
- Identify duplicate efforts and encourage collaboration both within the US and internationally by increasing community awareness of others work
- Encourage and increase publication of results of mechanics R&D in journals which has been historically poor
- Help to identify relevant journals to publish papers in detector mechanics
- Develop a forum for mechanics technologies and developments to be discussed--here is where we will need your help

Summary of international developments

- ECFA (European Committee for Future Accelerators) matrix of “experiment/detector” mapped to technologies / R&D (DRD)

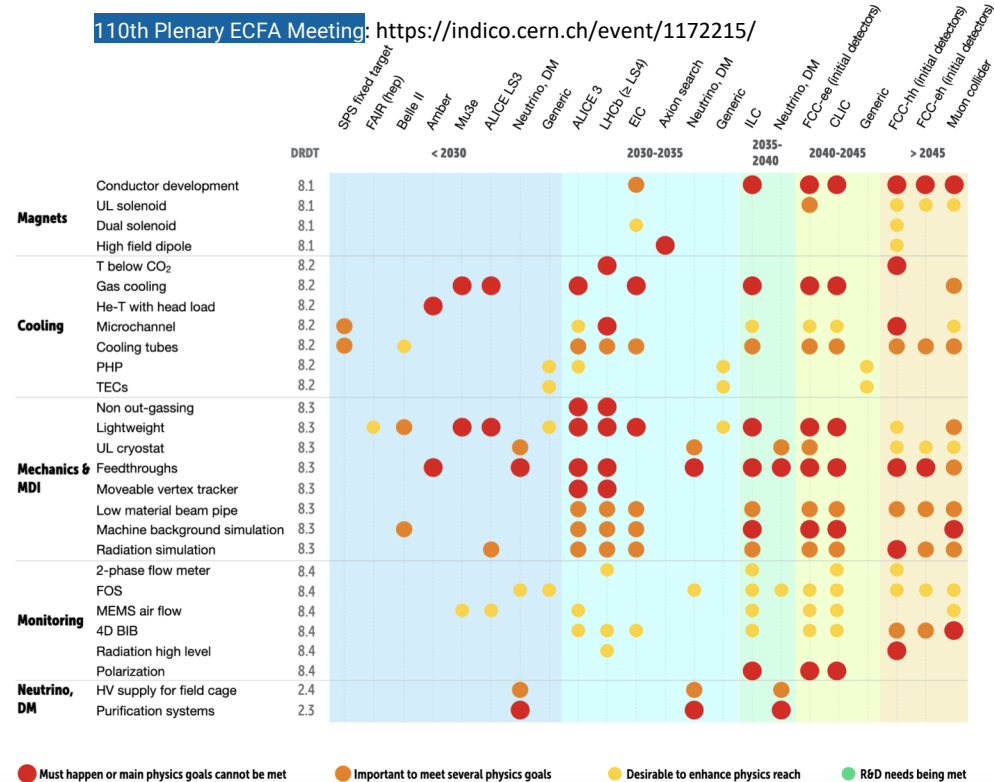
- ECFA Detector R&D roadmap: <https://cds.cern.ch/record/2784893>

- European Developments:

- Interest to form European Detector R&D on Mechanics, Integration, and Cooling

- Topics: Gas & single and 2-phase cooling, humidity+temp+thermal, TIM, pipe materials, materials, 3D printing, Radiation, FEA’s, Structural design, ML for support designs
 - Community Meeting for R&D collaboration on Tracking Detector Mechanics, Dec 6th [indico](https://indico.cern.ch/event/1344395/):
 - <https://indico.cern.ch/event/1344395/>

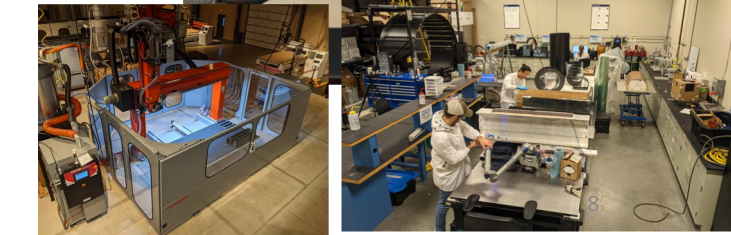
110th Plenary ECFA Meeting: <https://indico.cern.ch/event/1172215/>



● Must happen or main physics goals cannot be met
 ● Important to meet several physics goals
 ● Desirable to enhance physics reach
 ● R&D needs being met

FTDM workshop at Purdue U

- Registration Fee's likely around ~250\$ / person
- Mark your calendar: 2024 edition of FTDM:
 - **Wed - Fri: 29th - 31st May 2024**
- 3 full days merged with "Practical Factors @LBNL"
 - 3 days at Purdue FTDM + LBNL event (see next slide)
 - Tours of Silicon & Composite labs @Purdue/LBNL
 - Poster Session
- Plenaries & Breakout sessions
 - All plenaries at the Purdue Composite Center
 - Can accommodate around 100, up to 125 top's in person
 - AV/Room rent included, coffee break all days
 - 2 breakout rooms available if needed



Part II: FTDM – Composites Workshop @LBNL

- Modeled after the 2016/2018 “Composites Workshops” at LBNL and CERN:
 - <https://conferences.lbl.gov/event/54/>
 - <https://indico.cern.ch/event/736952/>
- Registration separate: limit ~40 persons
- Theory and hands-on fabrication training for early career engineers, techs, and technical physicists
 - Pre-preg Vendor visit on last day for travel flexibility
- Hosted by LBNL, Berkeley, USA in similar fashion to the 2016 edition
 - Follows the FTDM at Purdue to ease travel from European side, not much difference for Asia region
 - LBNL in the news on construction of ATLAS structures
 - Recent News at LBNL: [Construction phase well underway](#),



Outlook

- Community building towards a R&D collaboration towards Mechanics, Services and Cooling
 - Join the CPAD RDC10 email lists
 - Start monthly/bi-monthly meetings in Jan 2024
 - Community survey
- P5 will release the priorities early December and a town hall at Fermilab on 11th December
 - <https://indico.fnal.gov/event/61641/>
 - We all hope for strong message towards R&D needed to realize **any** of the many future collider and detector proposals put forward
 - Exciting time!



Backup

110th Plenary ECFA Meeting

<https://indico.cern.ch/event/1172215/>

