







Participation aspect of EIC- INDIA group in PID for EIC

Shuddha Shankar Dasgupta
on behalf of EIC-INDIA group

OUTLINE

- **Indian Institutes**
- **Main Interest**
- **Possible
Activities to join**
- **Conclusion**

Interested institutes in India for PID

			Particle Identification Detector (BHU, NISER, and IOP) – Bhartendu Singh	
			Institute	Interest
			University of Goa	Track finding and fitting, MPGD Tracker/PID
			Panjab University	MPGD Tracker/PID
			MNIT	PID and Tracker
			RMRCK	PID and Tracker

(i) In kind labour contributions for detector R&D, detector simulations, testing, quality assurance, commissioning and operations.

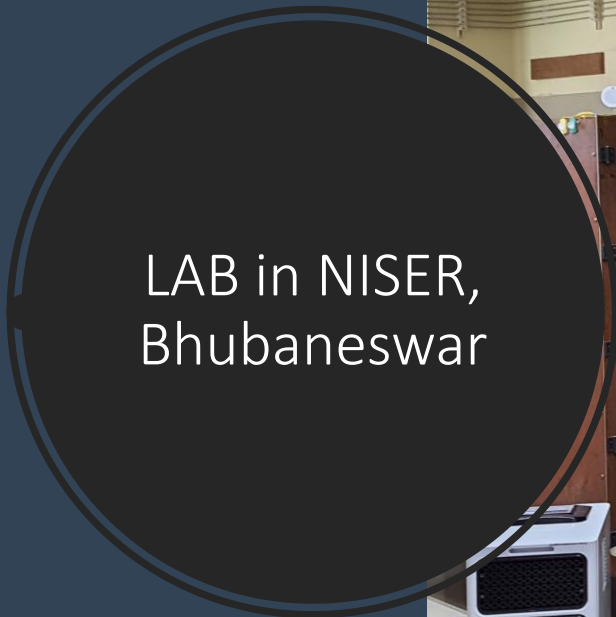
(ii) Provide access to other EIC groups to existing facilities in our laboratory for detector related work.

Main Interests

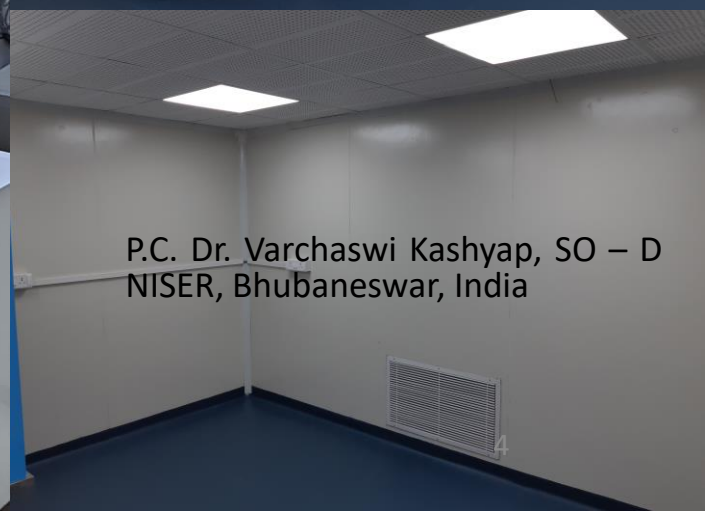
- **The focus is to participate on PID group mainly focusing on Photon detector development and studies.**
- Work is ongoing for setting up the basics: Lab space, organizing people, giving responsibilities etc.
 - **Already selection of 3 Scientists has been done in NISER (2 Gaseous Detector Expert, 1 Silicon Detector Expert) along with technicians and electronics experts (Process ongoing).**
 - **In NISER A huge lab space of ~ 400m² [~ 4000 sq feet] is currently under preparation. Including class 1000 and class 100 cleanrooms -> aiming for Cryogenic detectors, Gaseous Detectors, Photon Detector, MPGD based detectors and Silicon Devices.**
 - **Banaras Hindu University has a setup for photocathode coating and characterization setup based on VUV monochromator system.**
 - **Institute of Physics, Bhubaneswar has existing facilities for Detector R&D along with simulations studies.**
- **People are getting organized for Simulation, Software Studies...**

Existing facilities for Detector Development and Characterization

8/26/2021



Shuddha Shankar Dasgupta INFN Trieste, on behalf of NISER
Bhubaneswar and EIC India group



P.C. Dr. Varchaswi Kashyap, SO – D
NISER, Bhubaneswar, India

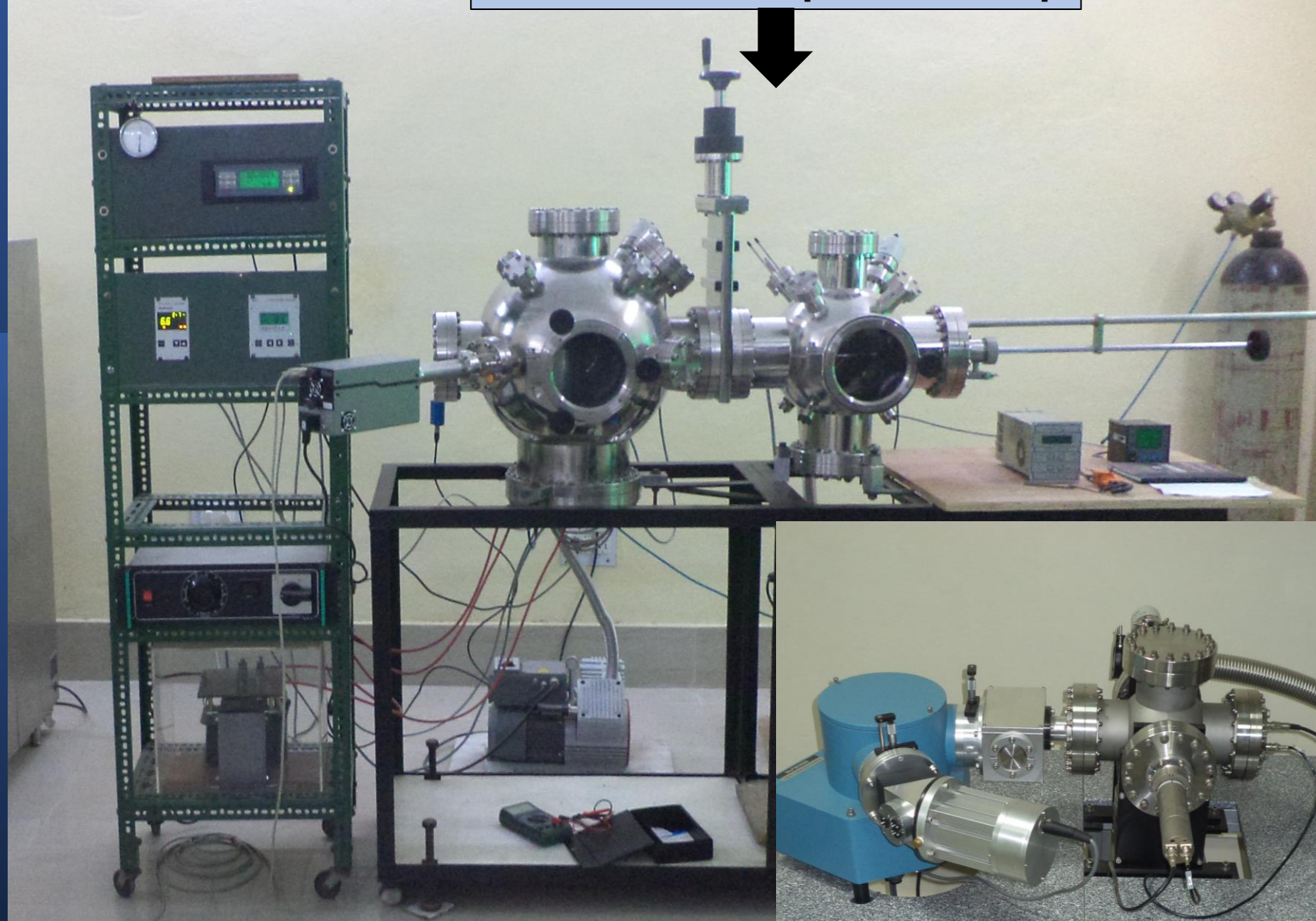
Lab of Prof. Bhartendu
Kumar Singh Ji. In BHU

Available
Setup in
BHU PC Lab,
India

P.C. Triloki Pandit, Ex PhD in this lab, Current
Post Doc in INFN Trieste

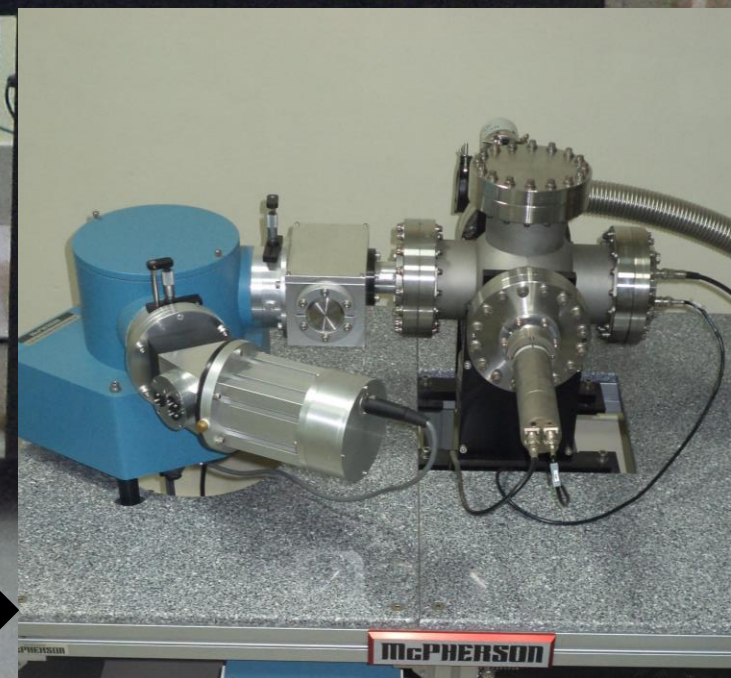
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Photocathode Evaporation Setup



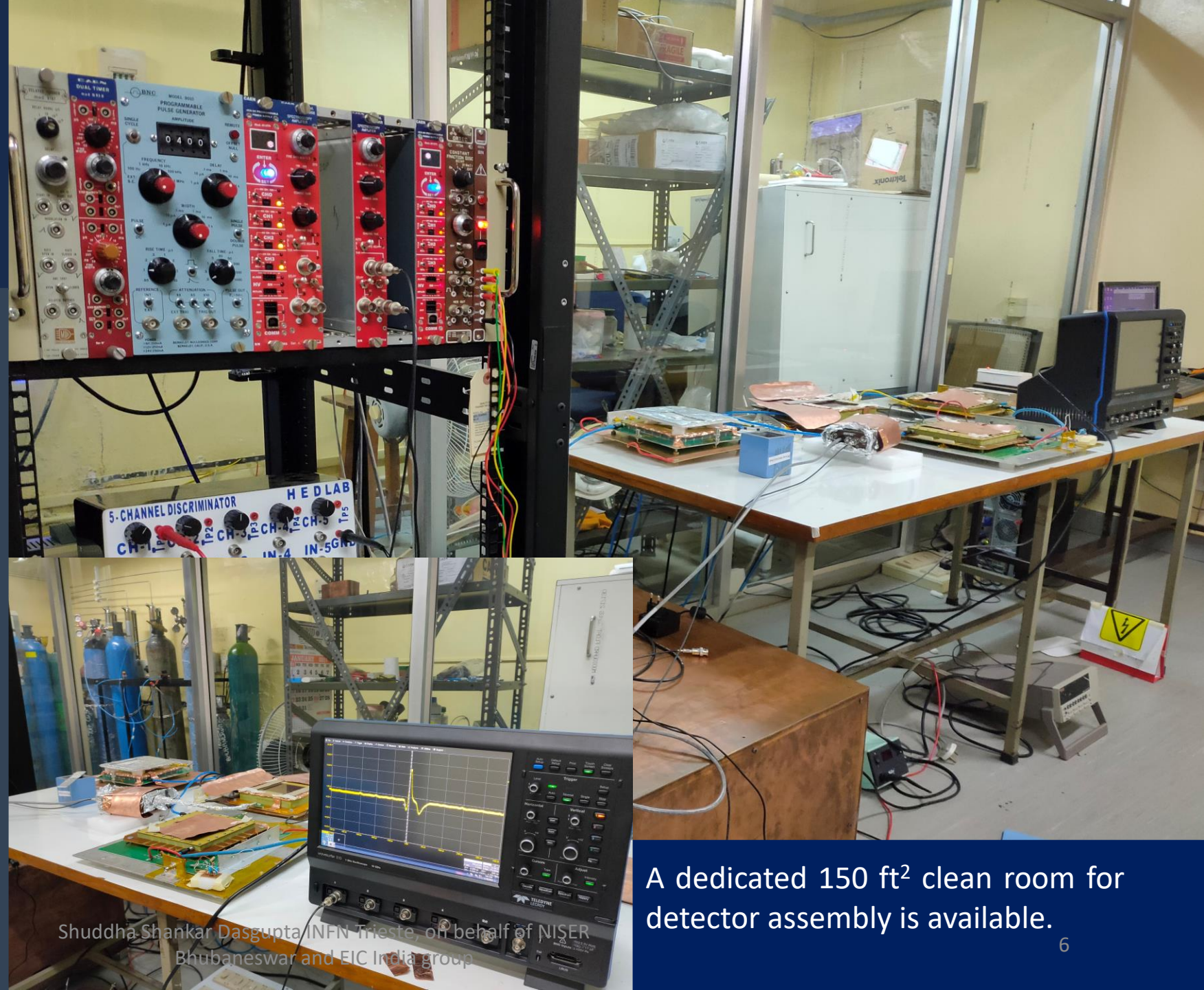
VUV Monochromator based PC
Characterization Setup

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Bhujaneswar and EC-India group



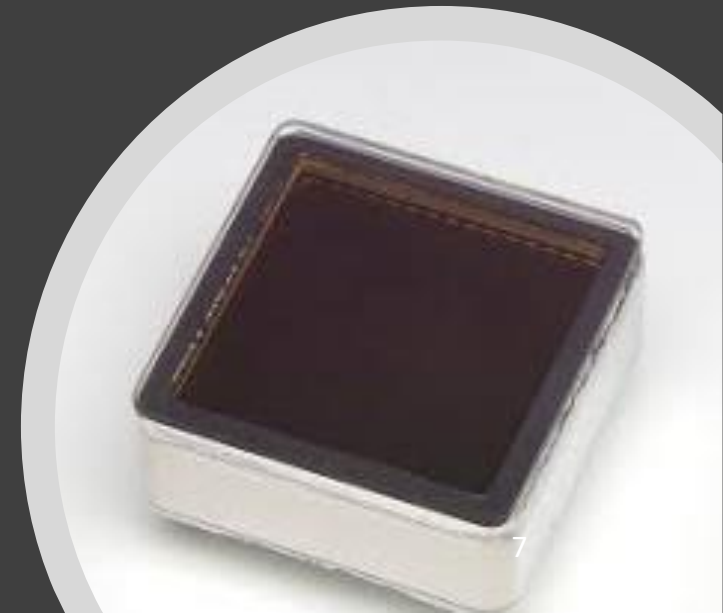
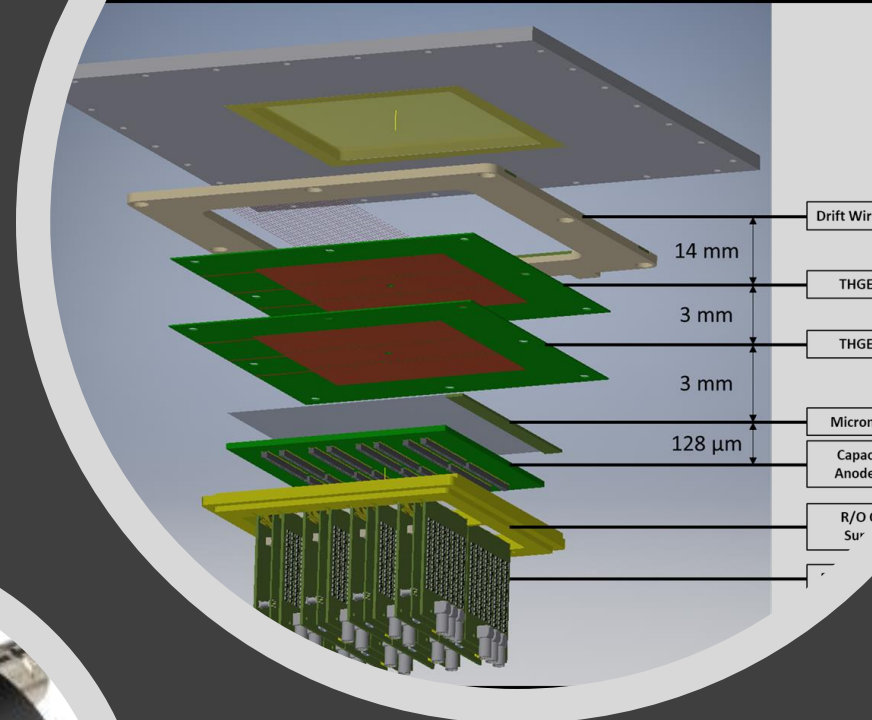
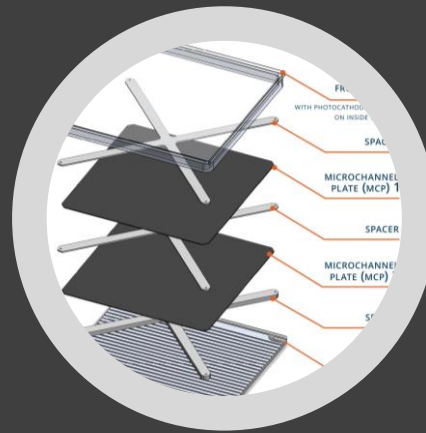
Facility at IoP Bhubaneswar

Available
Setup in IoP
Bhubaneswa,
India



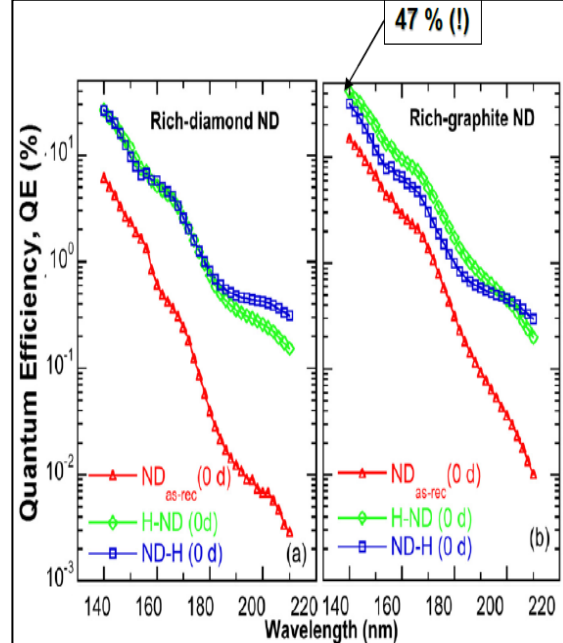
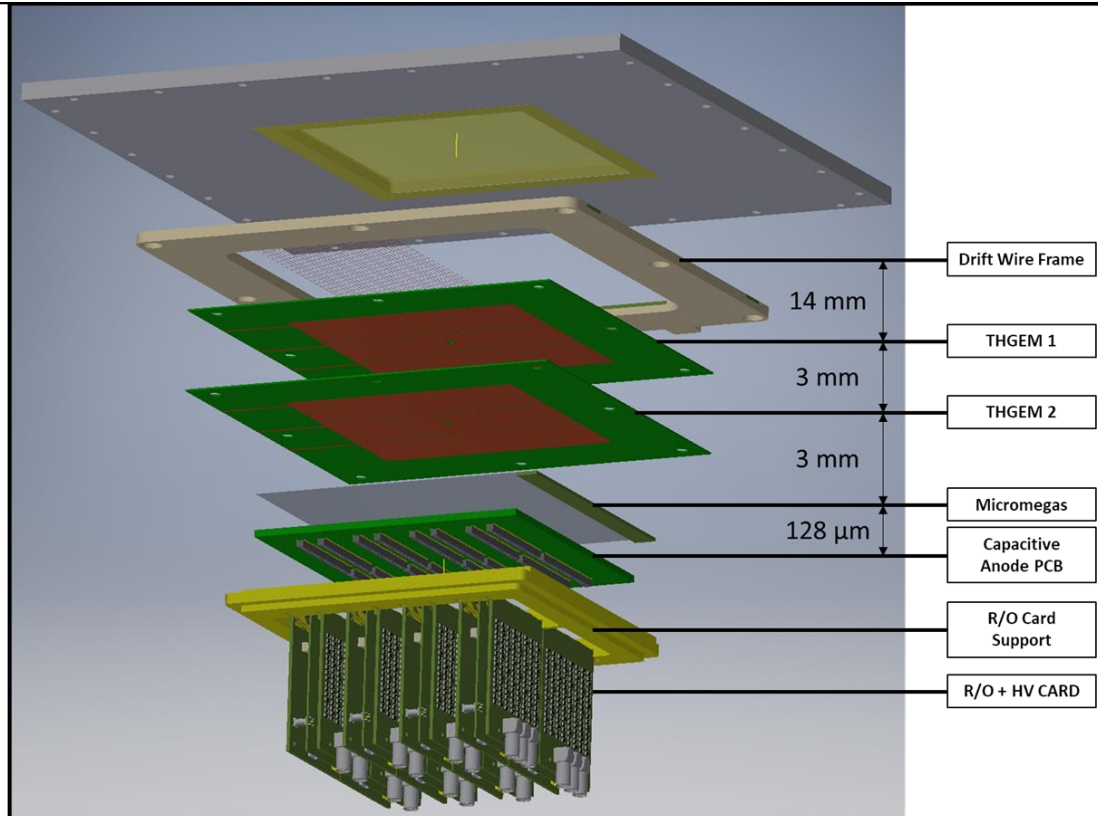
Main Interests

- Goal is to work on
 - MPGD based Hybrid Photon Detectors or
 - [LAPPD](#) or
 - MCP PMTs
- Or whatever new and interesting technologies will be decided for Photon Detectors in Future.



Motivation of this specific R&D I am involved now

- Demand of a compact RICH for the future EIC ▶ short radiator length (Limited number of Photons) ▶ **windowless RICH (fused Si Quartz window opaque@165 nm)** ▶ Gaseous detectors (?).
- **CsI** most used, however ageing due to **humidity and ion bombardment** ▶ quest for novel PC with sensitivity in the far UV region ▶ H-ND powder as possible alternative photocathode of CsI ▶ on going R&D INFN Trieste, Bari & CERN group.



Diamond & Related Materials 76 (2017) 1

THGEM + MM hybrid Single Photon detector prototype with 3 X 3 mm² PADs with novel H-ND Photocathodes → Ongoing R&D in INFN Trieste.

Conclusion

- Along with we would like to participate strongly in Simulation studies, validation of the concept, Detector Constructions and characterization, Quality Control and commissioning etc. along with the course of the development according to the need of the collaboration
- Myself a postdoc in INFN Trieste [working for 10 years with the group] has been selected as a scientist for NISER,. Looking forward to keep working together with INFN Trieste Group, new collaborators and with INDIA EIC Family.

THANK YOU

