PicoSEC MC-NET

Faraah Ben Mimoun Bel Hadj , Mythra Varun Nemallapudi

THE PICOSEC MC-NET PROJECT

ENDO TOFPET US
Endoscopic TOFPET & Ultrasound

Pico-second Siliconphotomultiplier-Electronics-Crystal research-Marie- Curie-Network :
Multidisciplinary training program for **young researchers** in an R&D project to develop **a new class of ultra-fast photon detectors** for **PET** and **HEP**.
Bring together early career researchers and experienced colleagues from across the world

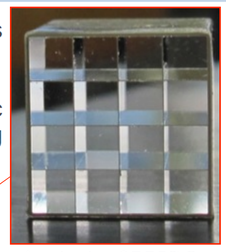
The EndoTOFPET-US : European medical project

Matrix 9x18 of LYSO scintillating crystals from Proteus

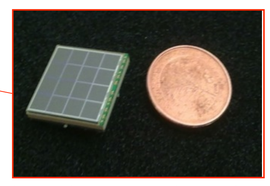
A novel imaging system for endoscopic exams of the pancreas or the prostate.

A combination of high resolution metabolic imaging with TOFPET and anatomical imaging with ultrasound.

The development of targeted biomarkers.

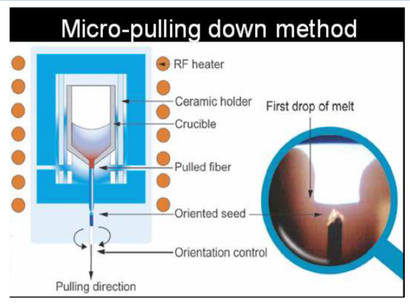


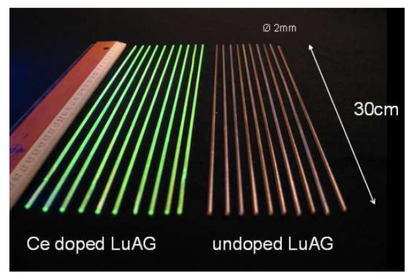
Matrix 4x4 of LYSO scintillating crystals from CPI

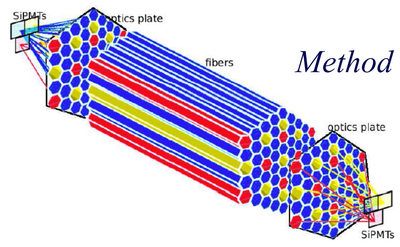


Photodetector SiPM from Hamamatsu

R&D for calorimeter for High Energy Physics particle detection







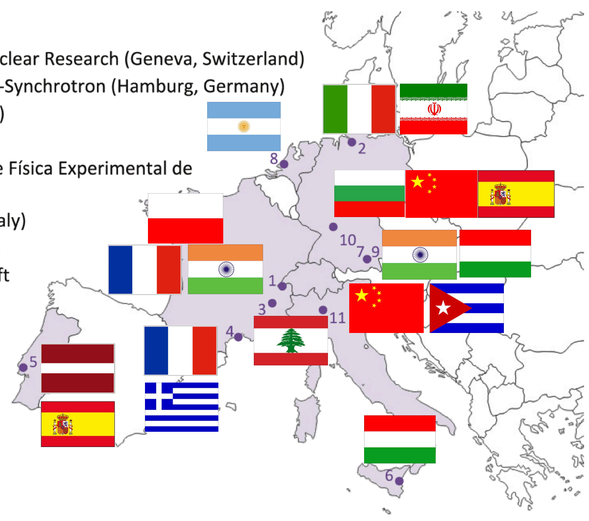
Method using by FiberCryst company to produce crystal fibers

Example of a conceptual Design (CERN)

The PicoSEC team and training

The PicoSEC Network

1. **CERN**, European Organization for Nuclear Research (Geneva, Switzerland)
2. **DESY**, Stiftung Deutsches Electronen-Synchrotron (Hamburg, Germany)
3. **FiberCryst** SAS (Villeurbanne, France)
4. **Kloé** SA (Montpellier, France)
5. **LIP**, Laboratório de Instrumentação e Física Experimental de Particulas (Lisbon, Portugal)
6. **ST Microelectronics** s.r.l. (Catania, Italy)
7. **SurgicEye** GmbH (Munich, Germany)
8. **TU-Delft**, Technical University of Delft (Netherlands)
9. **TUM**, Technische Univ. München (Germany)
10. **UHEI**, Ruprecht-Karls-Universität Heidelberg (Germany)
11. **UniMIB**, Università degli Studi di Milano Bicocca (Italy)



Main training events & conferences	Lead Institution	Project Month
Workshop on Intraoperative Imaging and Navigation Solutions – from basic research to medical product; Visit of the Nuclear Medicine Department of the university hospital "Klinikum rechts der Isar".	TUM & SurgicEye	M12
Workshop on medical instrumentation Visit of "Heidelberger Ionenstrahl Therapie" (HIT)	UHEI	M22
Workshop on detectors for High Energy Physics; Visit of CERN	CERN, UNIMIB	M36
Network workshop on PicoSEC-MCNet results	All	M48
Specialized S & T training		
Short courses on crystals and scintillators	CERN, Fibercryst	M4
Short courses on laser lithography and diffractive optics	Kloé	M6
Short courses on quantum detection, single-photon imaging, SiPMs, SPADs	TU-Delft	M11
Short course on semiconductor devices, design and manufacturing	ST-I	M15
SiPM-School with Hands-On	DESY	M18
Short course on PET electronics and data acquisition	LIP	M24
Short course on image processing	TUM, SurgicEye	M38
Management & Administration		
Certification of medical products, Intellectual Property Rights (IPR), clinical studies, marketing and sales	TUM & SurgicEye	M12
Lecture on management	ST-I	M30
The route to market: how innovation moves from laboratory to product.	Fibercryst & Kloé	M33
Intellectual Property Rights (IPR)	CERN	M36

Faraah Ben Mimoun Bel Hadj (ESR-3)

Studies in Grenoble, France :

Master in Physics, Electronics, and Materials
2011 **Biomedical engineering** specialization

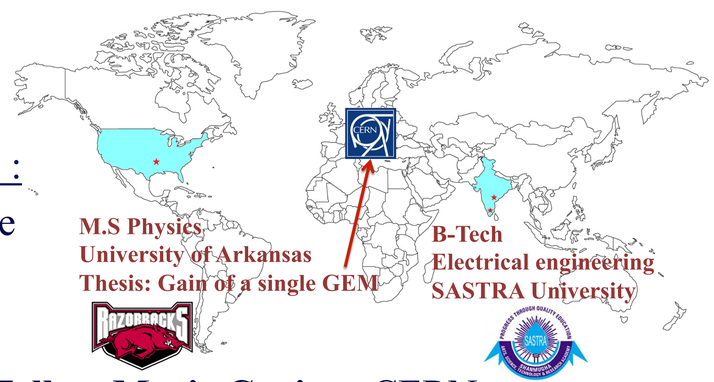
Previous experience :
2010 : **IR4M, CNRS Paris** Sud in collaboration with oncology institute Gustave Roussy ; image processing of two modalities : MRI and US
2011 : **CEA Grenoble** ; gain to have spectrometric information in medical radiography
2011 : **VIA** at CERN

Present work : 09/2012 : **Fellow Marie Curie** at CERN,
⇒ Assembly of detector modules
⇒ Optimization of the coupling scintillating crystals & photodetectors

Training and dissemination:
⇒ Presentation of a technical poster during the EPIC workshop in Paris
⇒ Technical training : CATIA, design software

My future beyond PicoSEC
Working in a hospital or research institute to improve the medical imaging devices and their use

Mythra Nemallapudi (ESR-2)



Studies around the world :
2004 – Pre-college, Science
2008 – B-Tech, EE
2012 – Masters, **Physics**

Present work : 09/2012 : **Fellow Marie Curie** at CERN,
⇒ Silicon Photomultipliers for photon detection in PicoSEC – CERN
⇒ Applied for PhD in IST, Portugal
⇒ Objective : Expertise in particle detector instrumentation

Training and dissemination:
⇒ PicoSEC network trainings
⇒ Technical training : Labview, software for instrumentation
⇒ French courses

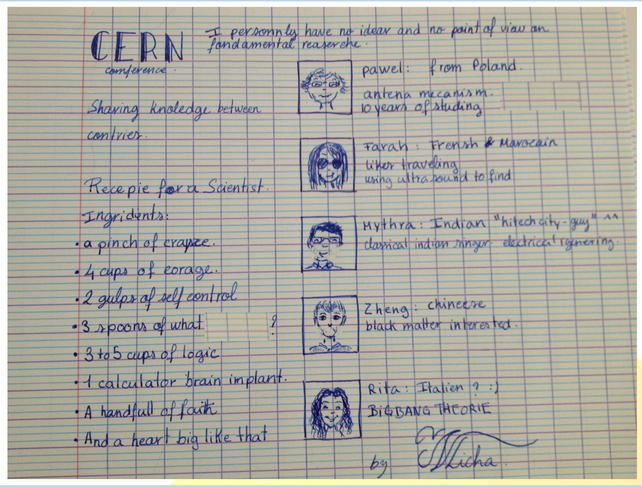
My future beyond PicoSEC
Founding an institute for prototype development and commercialization of academic research

Outreach Activities

High School St Exupery in Bellegarde (France)

Explanation of our studies, present work
by doing presentations and games with a class of 1ère S :
15 students whose 3 girls of 16 years old.

STAT



CERN, Geneva, April 2013

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