



JABLOTRON ALARMS, a.s.

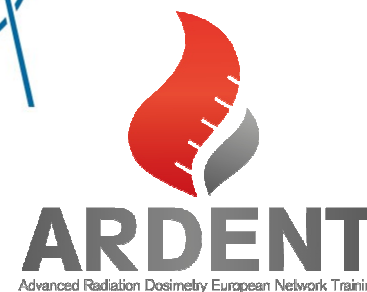
Collaboration with CERN / Medipix and ARDENT

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Dr. Vijayaragavan VISWANATHAN

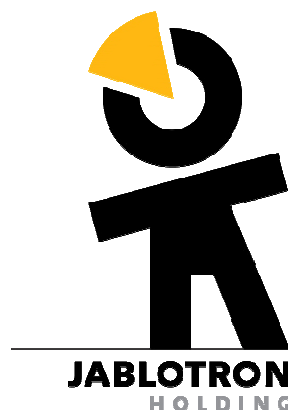
vijay@jablotron.cz



▶ JABLOTRON Holding



- Established in 1990 = 20 year history
- 100% Czech private company
- Specialization = flexibility
- Diversification = stability



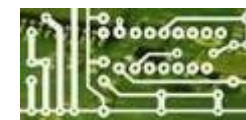
Jablotron SK
Distribution

Jablotron Alarms
Alarm systems

Jablotron Security
Central monitoring

JabloCOM
GSM phones

JabloPCB
Manufacturing



► JABLOTRON ALARMS



Products:

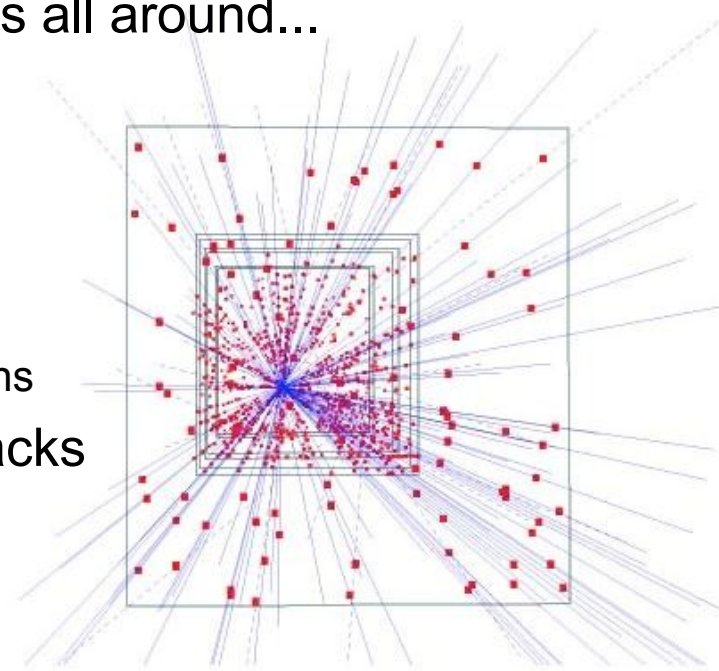
- Building alarms (83%)
- Home automation
- Car alarms
- Baby breathing monitor
- Digital photo album

Totally about 160 items

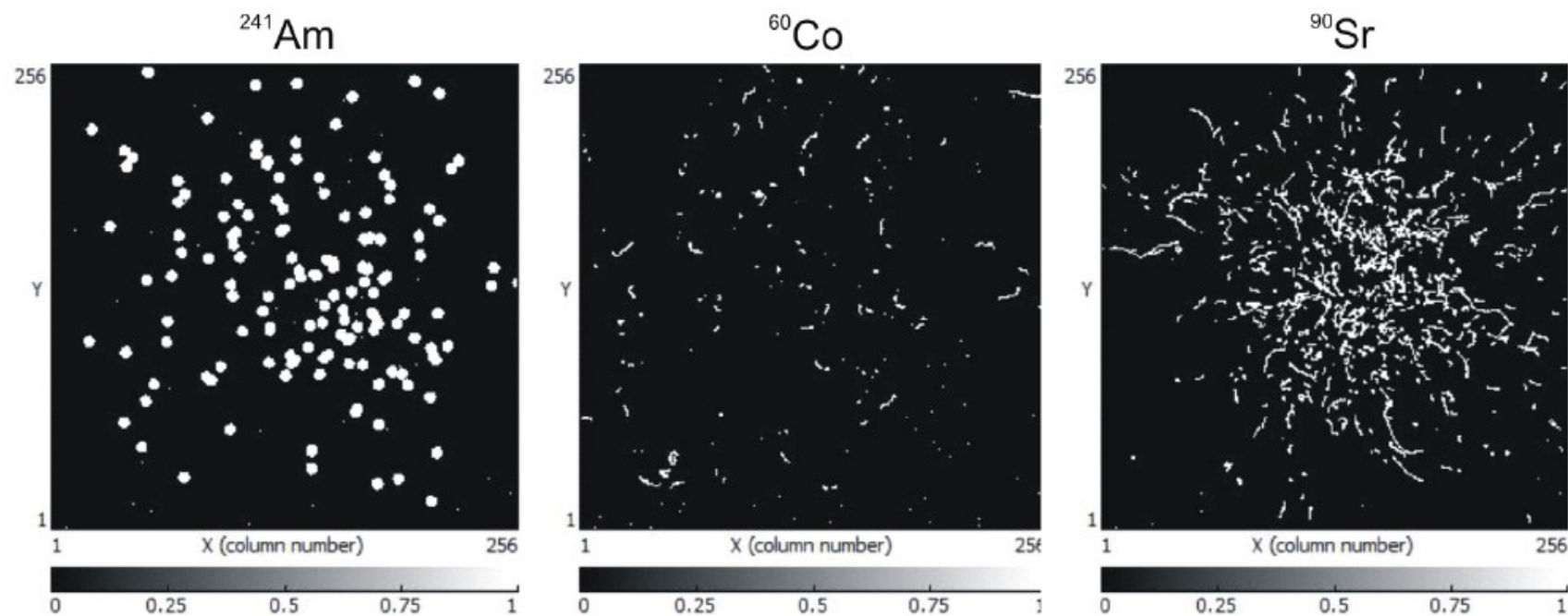


► CERN + Medipix = Timepix

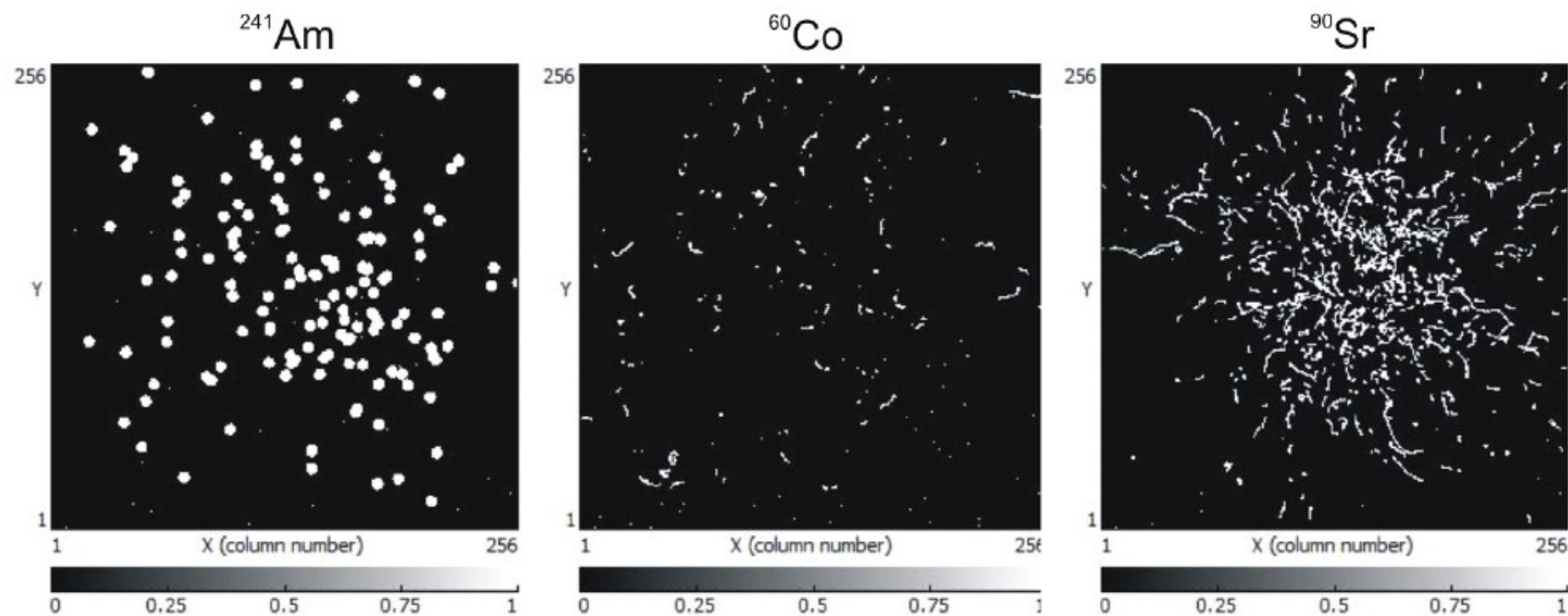
- Medipix Collaboration - 1990 - CERN
- Development of hybrid pixel-array detector of ionizing particles
- Outcome of the initiative = Timepix
- Camera into the world we cannot see but is all around...
- 256 x 256 pixels, 55um pitch
- 14mm x 14mm surface area
- What we can see?
 - Heavily charged particles (alpha, beta...)
 - X-rays, Gamma rays, Hot neutrons, Fast neutrons
- Various types of particles leave various tracks
- Shapes of the tracks can be recognized
 - ... so the type of the particles
 - ... and the amount of energy



▶ Seeing is believing

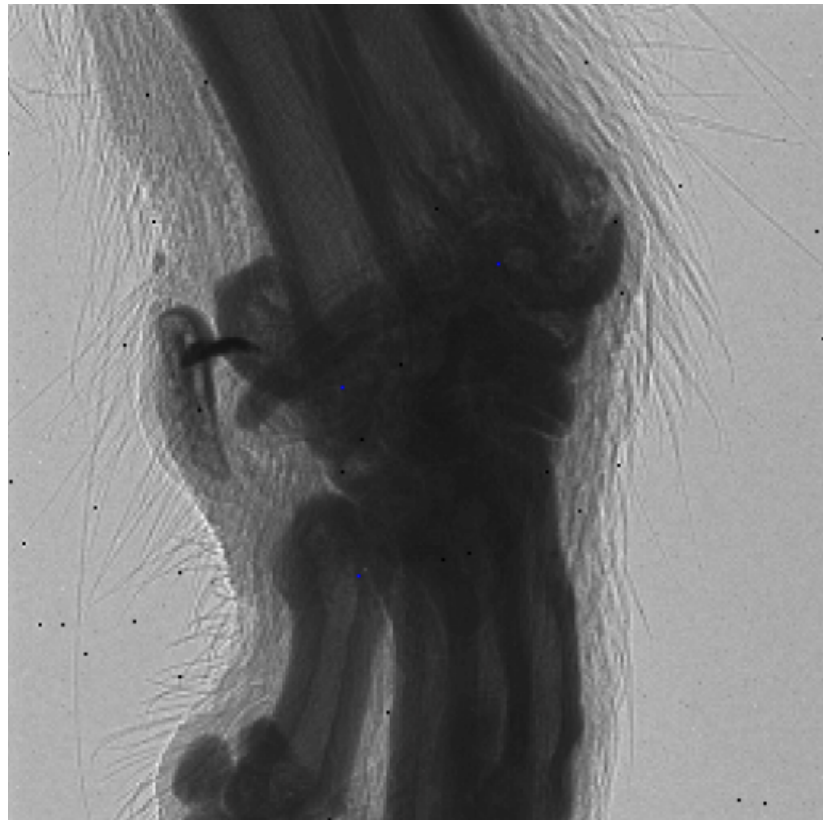


▶ Seeing is believing



▶ Seeing is believing

The leg of mouse...

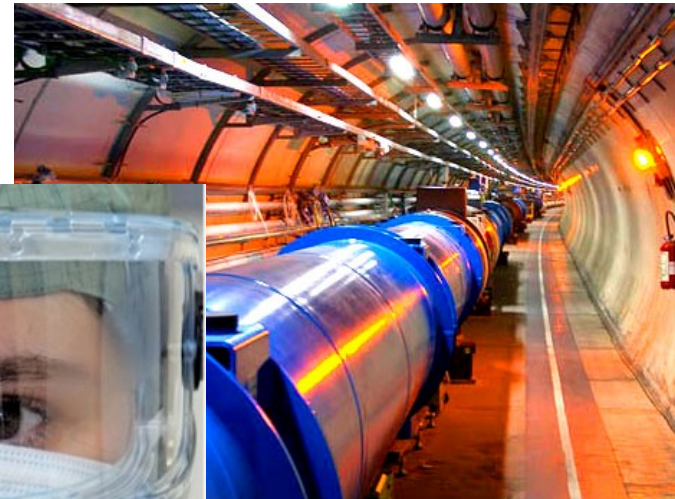


The bone of mouse...



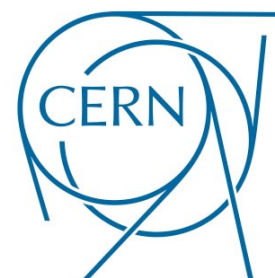
► What is it all good for?

- Get a knowledge about the environment all of us live in
- Medical - particularly less harmful form of human body screening
- Safety - potential application of intelligent dosimeters
 - Feedback not just about the amount energy with traditional dosimeters
- Tomography, material analysis
- Industrial - e.g. nuclear power plants
- Educational - schools, universities
- Research - LHC, satellites, bio studies



▶ The very first steps

- Year 2010 - The first mission to CERN
- CEO Mr. Dalibor Dědek
- Faced a challenge to get a “go ahead”...
- Acquired two types of licenses for application of Timepix detector:
 - Educational toolkit
 - Homeland security detectors
- Primary objective
 - Support research
 - Encourage new ways of education strategy
 - Learn something new and diversify our know-how
- “Learn by providing a teaching tool”
...our first aim was the educational kit



▶ IEAP

- Institute of Experimental and Applied Physics in Prague (ÚTEF)
- Division of CTU (ČVUT)
- Founded and led by Dr. Stanislav Pospíšil (from 2002)
- One of the core contributors in Medipix Collaboration
- Results have been widely recognized around the world!
- Strong engagement in-between JABLOTRON and IEAP



<http://www.utef.cvut.cz/en>

▶ MX-10 The tool

- Timepix-based USB connected measurement tool for schools and universities
- First few detectors are being already successfully tested
- Deploying into the market from Q1 2013
- The result would have never come out without IEAP
- Mutual synergy at the first sight
 - Hardware engineering and manufacturing (JABLOTRON)
 - Sophisticated proven firmware / PC software and years of experience (IEAP)



► What's next?

- Homeland security portable detector
- Hand-held-like device for police, fire-brigade, airport security, etc.
- Intelligent dosimeter
- Developed under ARDENT / CERN initiative
- JABLOTRON has recruited a talented researcher from overseas particularly for this project - Dr. Vijayaragan Viswanathan



▶ ARDENT



- Advanced Radiation Dosimetry European Network Training initiative
- Marie curie initial training network under EU FP7 – 4M€

- 7 Full partners

- CERN (coordinator), Switzerland
- Austrian Institute of Technology, Austria
- Czech Technical University – IEAP, Czech republic
- Jablotron Alarms a.s, Czech republic
- Politecnico di Milano, Italy
- MI.AM, Italy
- IBA Dosimetry, Germany



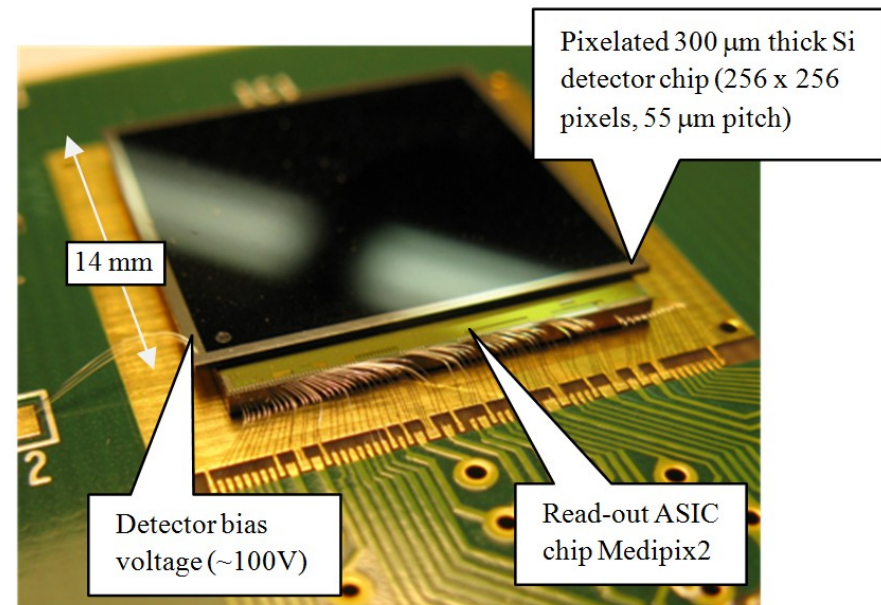
- 5 Associate partners

- ST Microelectronics, Italy
- University of Erlangen, Germany
- University of Houston, USA
- University of Ontario, Canada
- University of Wollongong, Australia



► Objectives

- Development of advanced instrumentation for radiation monitoring
 - Radiation dosimetry
 - Micro and nano-dosimetry
 - Photon and neutron spectrometry
- Technologies
 - Gas detectors
 - Solid state detectors
 - Track detector techniques
- Applications
 - Characterization of radiation fields
 - Homeland and security
 - Check radiation leakage
 - Around nuclear power plants
 - Medical environment (e.g X-ray rooms)



Source: IEAP, Czech technical university

- Participate in the international research initiative
- Bring research from point of view of private enterprise
 - Research
 - Feasibility study / Market survey
 - Production
 - Marketing
- Development of Medipix-based radiation monitoring system
 - Design of Medipix/Timepix monitoring system to fields outside elementary particle physics
 - Development and preparation of educational kit for high schools and universities
 - Investigation of possible applications in radiation

▶ Conclusion



- ARDENT will bring
 - High energy physics outcome to other fields
 - Research focus in radiation dosimetry
 - External collaborations
 - Extensive training and learning opportunity for early stage researchers
 - Skilled manpower in the radiation dosimetry field
 - Educational toolkit for students
 - To cultivate passion towards research
 - Hand held radiation monitoring instruments
 - To better understand and characterize the environment

► Questions ?

JABLOTRON
CREATING ALARMS

