



# COMPANY PROFILE

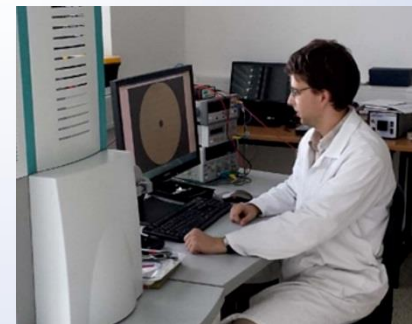
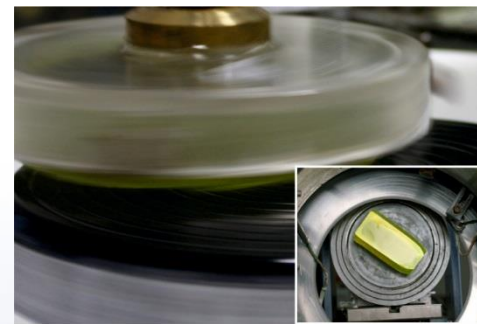
**JINR, Dubna**

**29-31th March 2016**

**Jiri Parizek**

Technology application specialist

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# COMPANY PROFILE



- Tradition in crystal growth back to 1943
- 130 employees



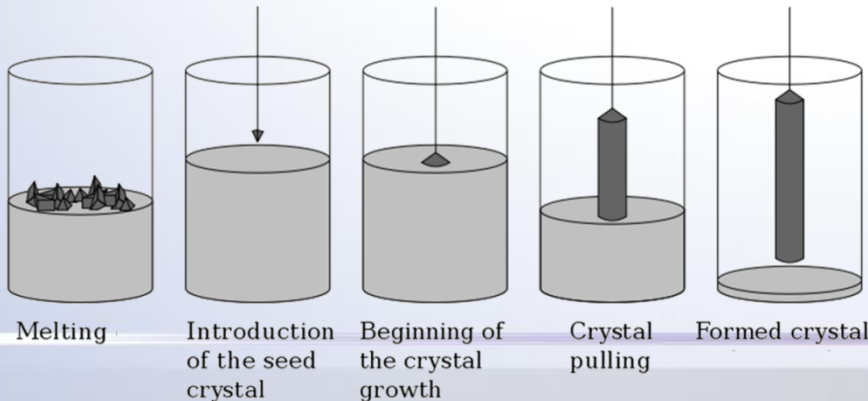
- Scintillators and detectors
- Electron microscopy
- Lasers
- Thin-film coating
- Sapphire profiles

# TECHNOLOGIES

## – Crystal Growth



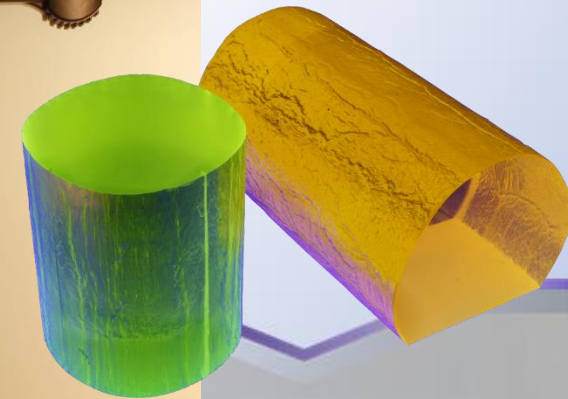
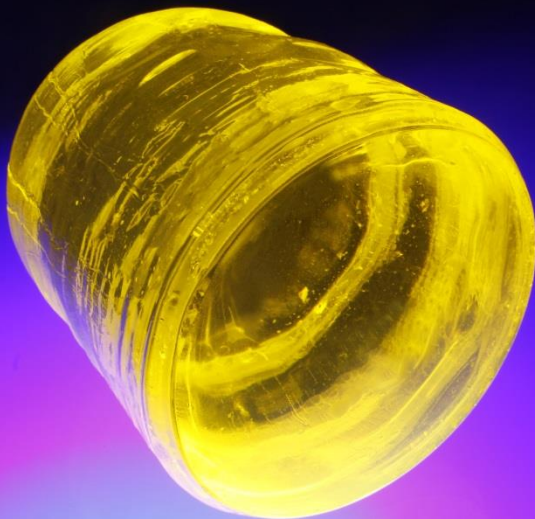
- based on Czochralski method
- patent EP 2675944
- Optimal choice of growth conditions (according to grown material)
- Strictly controlled process
- Homogenous crystal ingots



# MATERIALS (grown as single-crystals)



- Garnets YAG and LuAG
- Perovskites YAP
- Silicates, Tungstates (PWO)
- Dopants: Ce, Nd, Tm, V, Yb, Pr, Er, Cr



# Technologies



## ■ Precise processing of hard material

- crystals, metals, ceramics, PMMA
- laser quality , flatness  $\lambda/10$ , single crystal screen 5 micrometer thick

## ■ Coating

- Up-to-date equipment, on-line characterisation during the coating process – large laser mirrors
- Reflection, anti-reflection, conductive

## ■ Characterisation technologies

- el. microscope, interferometers, spectrometers 0,2 – 5  $\mu\text{m}$ , XRD, 3D structural analysis
- X-ray radiography
- back-up of characterisation techniques on university groups.

## ■ Quality control MIL, ISO



Crystal growth



Polishing



Coating



Quality control

# Contractual Research Collaboration



- Czech Academy of Sciences
- Czech Technical University (IEAP, FJFI)
- Institute of Scientific Instruments, Czech Academy of Sciences
- Charles University (PrF, MFF)
- Synchrotron and accelerator facilities
  - (CERN, PSI, ANKA, SOLEIL, ESRF, Fermilab, BNL, PAL)



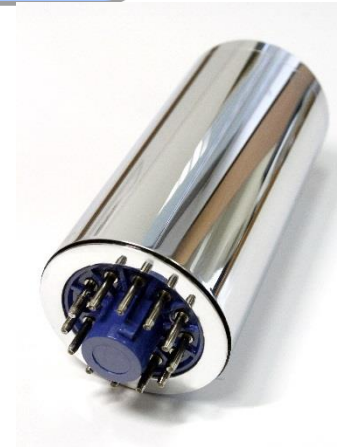
# Scintillators & Detectors



Neutron



Alpha - pixelized

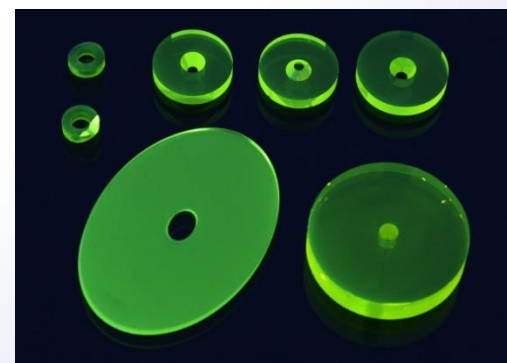


X-ray, gamma



X-ray/electron imaging

Integrated  
solutions

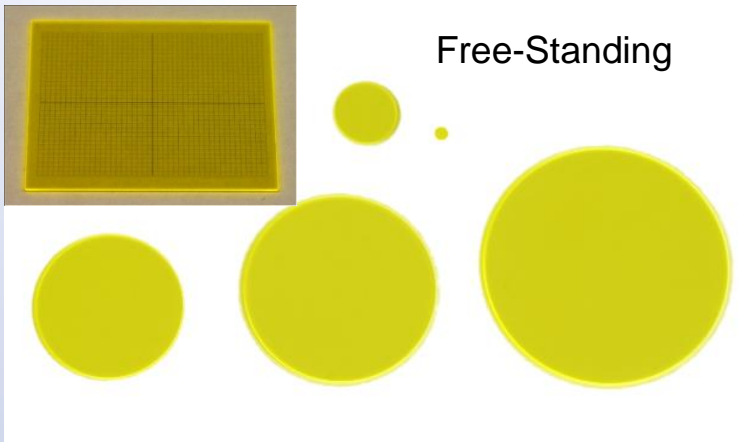
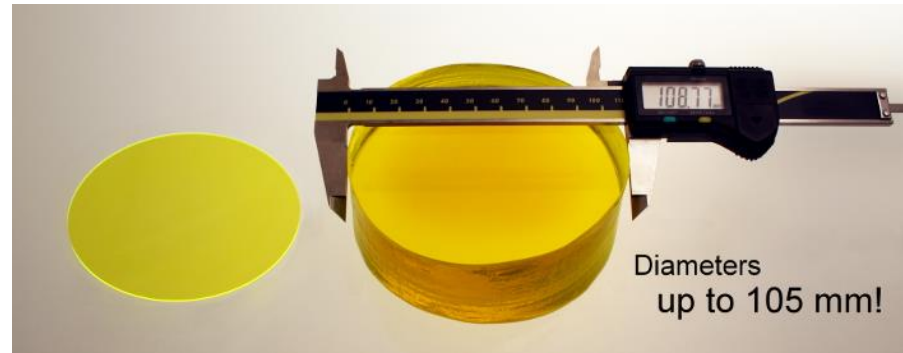


Electron detect.

# Imaging screens



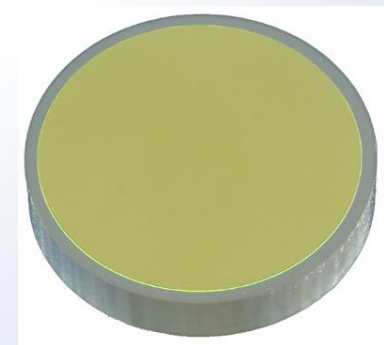
- Optical homogeneity
- High light output
- High Radiation Hardness
- Long life-time
- Outstanding chemical
- Outstanding mechanical stability
- Coatings & lithography



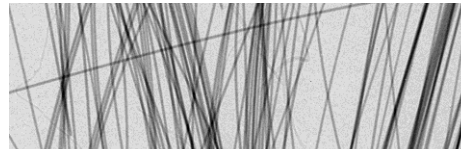
In Frames



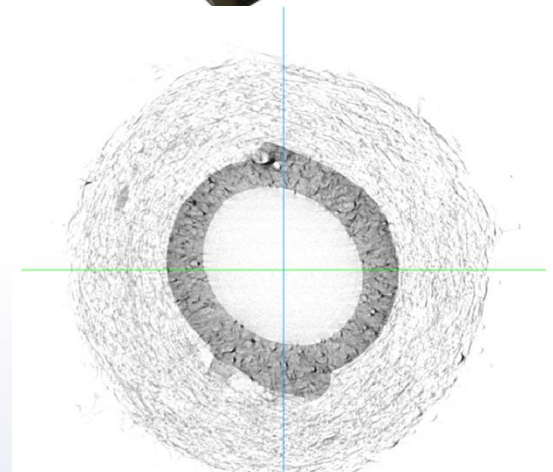
On Substrates



# Imaging systems - CRYCAM



Spider – 10  $\mu$ m resolution



Cotton Stick – 3D tomography

# Single photon counting



*"Ionizing radiation and neutron imaging has never been easier"*

**CRYPIX**



Art, Archeology  
Biological research  
Forensic science, Geology  
Particle physics  
Non-destructive testing

**RASPIX**

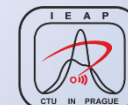


First alarm radiation monitor

**HORIZON**



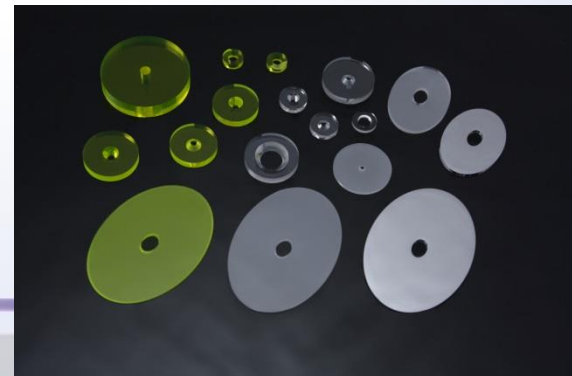
Soft x-ray imaging  
Ion beam tracking  
Alpha particles tracking



# Detection Units for Electron Microscopy



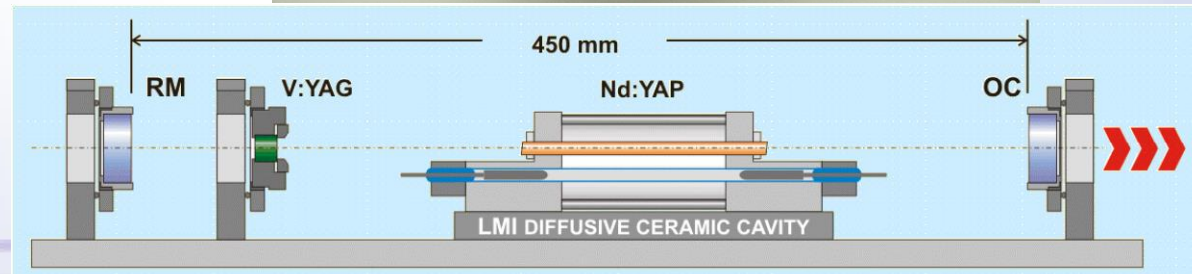
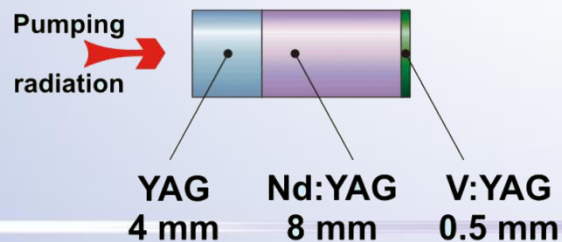
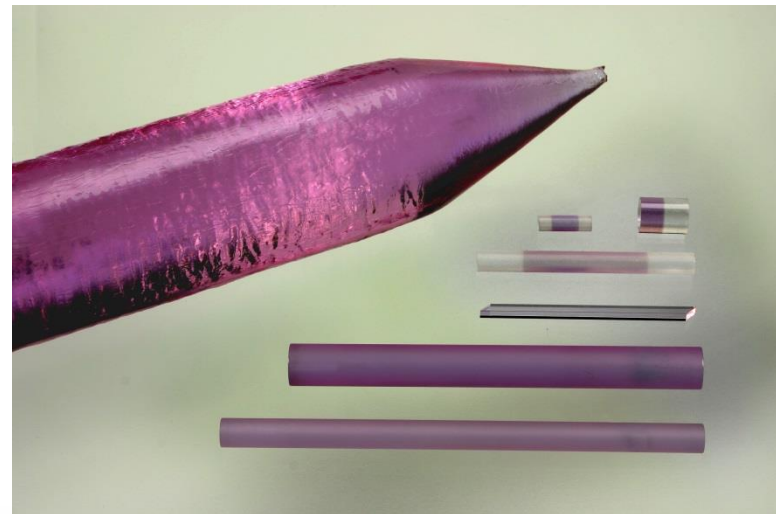
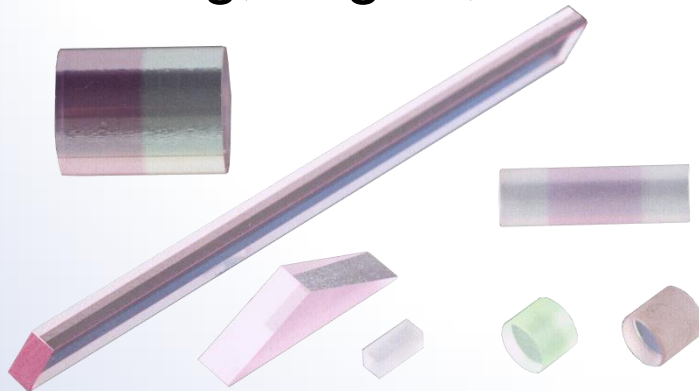
- Single crystals for BSE detection in electron microscopy – Crytur has a market majority globally
- Complete detection systems
- Clean-room facilities



# Lasers



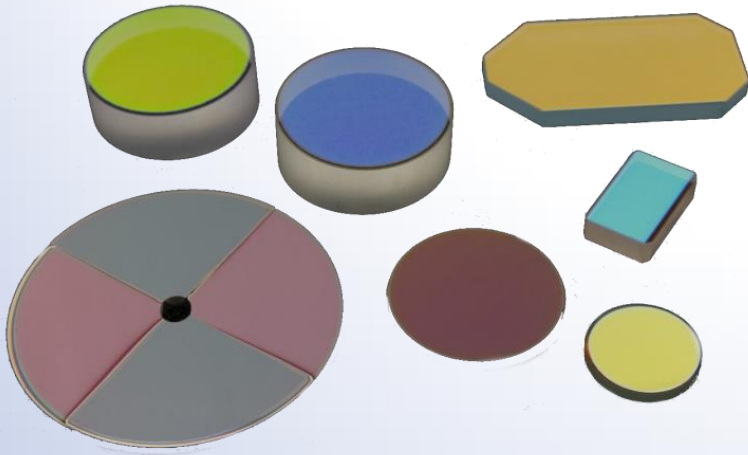
- Laser rods primarily for medical and defence industries
- Specialty materials – YAP, YAG, LuAG, BaWO<sub>4</sub>, etc.
- Bonding, angles, ...



# Coatings



High reflectivity mirrors, anti-reflection coatings, partial reflectivity mirrors, dichroic mirrors, beam splitters, graded reflectivity laser mirrors, optical filters, coated IR optics, etc.



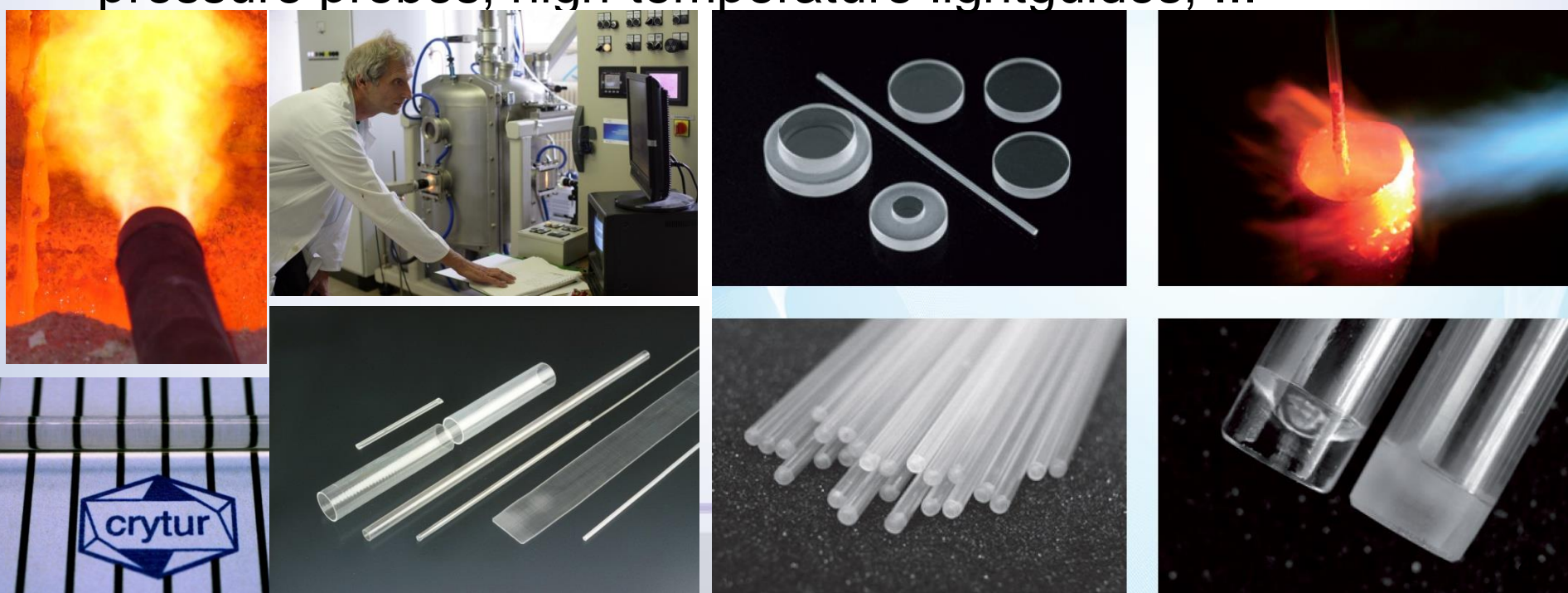
# Sapphire profiles



TUBES, RODS

Ø 0,5 mm to 45 mm, length up to 2 m

**Applications:** Temperature measurement probes, ultra-high pressure probes, high-temperature lightguides, ...



# Summary



- Reliable partner in **scintillation crystals** and **integrated solution**
- **Long-term collaboration** with international institutes
- **New partners welcome**



# Thank you for your attention!

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