

BBT – Materials Processing

R&D institute and IR optics production

Czech – Taiwan Space day, 19/1/2020, www.calomel.cz





Company Intro



01

Established

1991 as a small R&D company and technology institute, 10 key personnel

02

CEO/Founder

Cestmir Barta, PhD., project manager: Radek Hasal

03

Located

Zdiby (north border of Prague, Czech Republic)

04

Cooperation

Cooperation with about 40 partners (LZH, OHB, G&H), Technical Universities (Polymi, CTU) and Research and development institutes (Hilase, LZH) etc.

05

Ownership

66% Cestmir Barta, 34% FASTLITE (FR) as shareholder

History timeline

1984



TITUS on MIR space station

Crystal growth, solidification, diffusion, physical chemistry. Operational on board MIR station from 1995 to 2001.

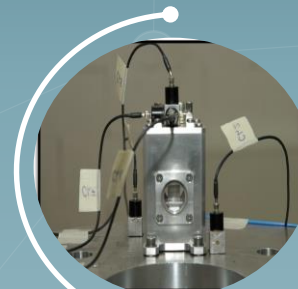
2001



Calomel IR optics

Investigation of potential of the Calomel optical monocrystals, new era of cooperation with ESA

2012



FTIR spectroscopy

New type of birefringent optics applied for hybrid FTIR spectroscopy device

2019



Commercial IR polarizers

MIR/LWIR optical polarizers commercialized and offered to optical market

CSK-1 crystallizer

Crystal growth experiments in microgravity conditions, 17 years non-stop on board the orbital complex MIR



1995

Termination of MIR

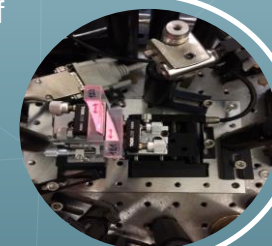
End of the Soviet space station and activity of the both experimental devices



2008

ESA space qualified

DEMON project dedicated for space qualification of the Calomel optical components for space environment



2016

Our Products



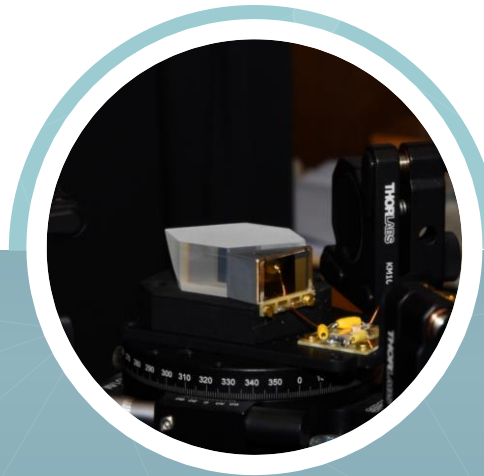
**Calomel
monocrystals**

- Broadband transparency 0.4 -17 μ m
- The highest birefringence $\Delta n = 0.683$
- Optically positive $n_e > n_o$
- High AO merit $M_2 = 800$



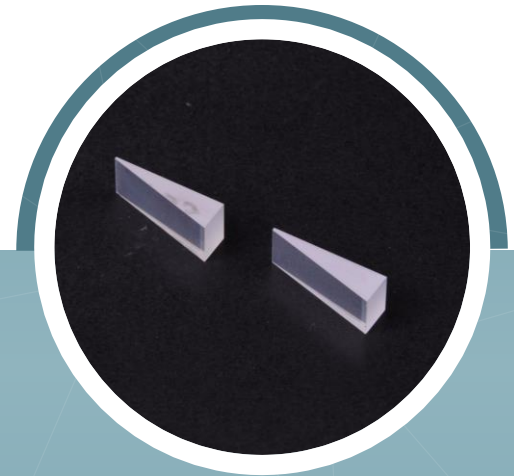
**IR polarization
optics**

- The highest ER on the market $>1: 20\ 000$
- Wide transparency (0.4 μ m-17 μ m)
- CW laser damage load resistance
- Potential THz and microwaves applications



Acousto-Optics

- The only material for AO $>5\mu$ m
- Substrates only
- AOTF, AOD, AOM



**Custom optical
components**

- Custom substrates
- Wedges, prisms, windows
- AR coated upon request

Application areas



Optics / Photonics

- Laser polarization and attenuation
- Thermal imaging
- MIR thermal imaging systems
- Thin film measurement



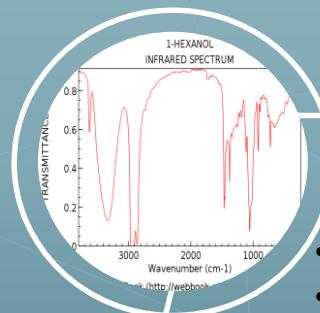
R&D

- Investigation of THz optics
- Polarization in micron and sub-micron areas
- AO devices



Space / Astronomy

- Analysis in infrared astronomy
- Observation in polarized light
- Telescopes, optical systems



IR Spectroscopy / Microscopy

- Infrared spectroscopy of materials
- Infrared microscopy (sample char.)
- Substrates for hybrid interferometry

Infrared Optics



- The highest ER > 1:20 000 on market
- Broadband transparency: 0.5 - 17 μ m



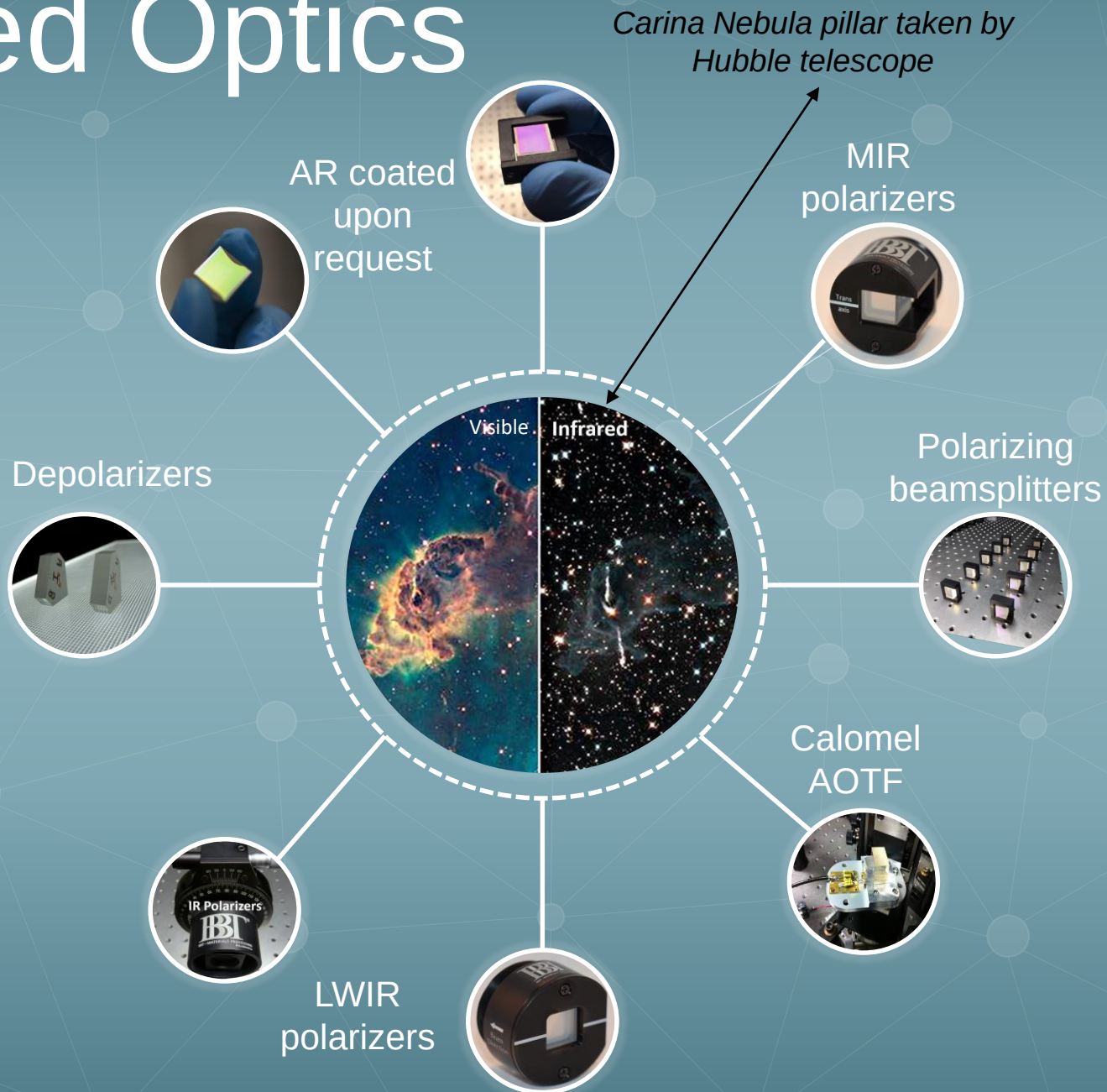
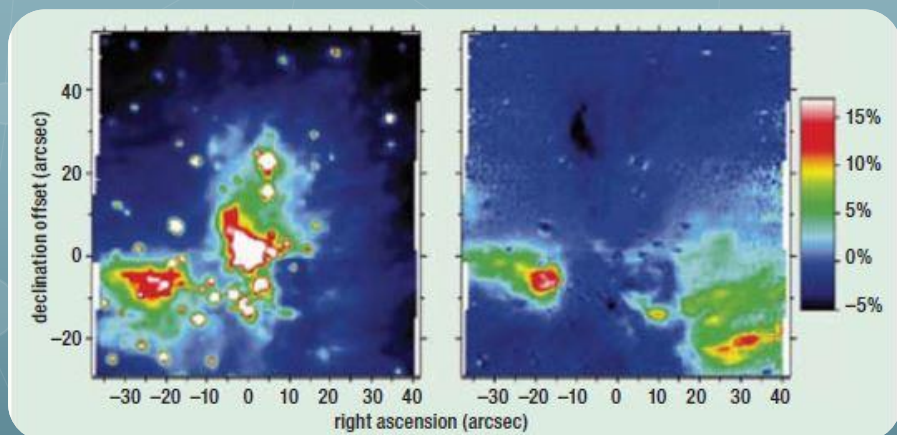
- Concept - Design - Product – Supply
- CW load resistance



- Remote sensing (EO) using AOTF
- Application in hyperspectral imagers



- Interstellar polarization
- study the nature of planetary surfaces and atmospheres.



R&D Activity

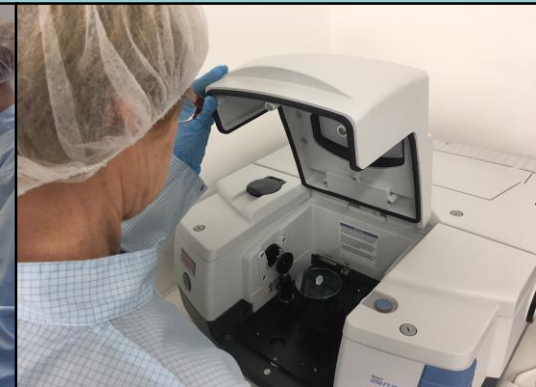
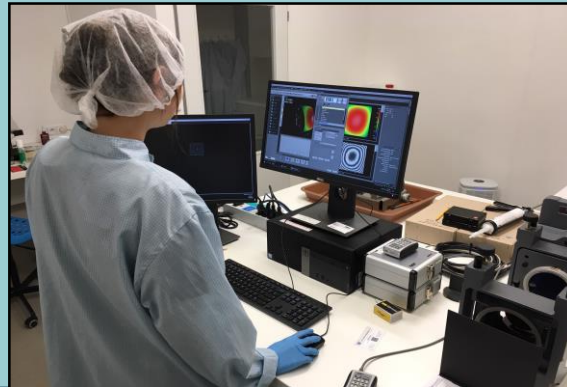


- NAOMI
- DEMON
- IAPETHOS
- IAPETHOS2
- THETIS – phase 1
- CALIOPE
- ECLIPSE

- MINERVA
- TROPIC (in preparation)

- MIRSA
- POFILASE

- TERA4TECH (in preparation)
- BITRAS (in preparation)



References and cooperation



THANK YOU

Contacts :



Cestmir Barta

CEO, Founder

e-mail: barta@calomel.cz
bartabbt@gmail.cz



Radek Hasal

Project manager

e-mail: info@calomel.cz
hasal@calomel.cz