n2M Nano to Macro

Materials Science from Production to Diagnostics

Research Team name: Innobay
Presenter name: Dr. Norbert Babcsán

Innobay is a consultation company. The company is collaborating with the Wigner Institute of the Hungarian Academy of Sciences, University of Miskolc, Aluinvent Inc, Infotronik Ltd. and Bay Zoltan Institute and several foreign company.

Team Presentation – Annual Workshop, COST Action MP1106
Dublin, September, 2012

Team's general info

Research Team Name: Innobay

Number of team members: 8

Brief description of team: studies, expertise, etc:



Team leader: Dr. Norbert Babcsán, PhD., Engineer Physicist

- 1 post doctoral fellow
- 2 Ph.D. students
- 1 M.S. student
- x ERASMUS students



- ❖ 1 Chemist
- ❖ 1 Materials Scientist
- ❖ 2 Engineer Physicist
- ❖ 1 Chemical Engineer
- ❖ 2 Mechanical Engineers
- ❖ 1 Electrical Engineer




Relevance to MP1106

Research interests related to MP1106:

• Study of bubbles and drops formation using video speed X-ray radioscopy in room and high temperature systems.

• Metal Foams

• Liposomes – Nanomedicine

• Nanotoxicology

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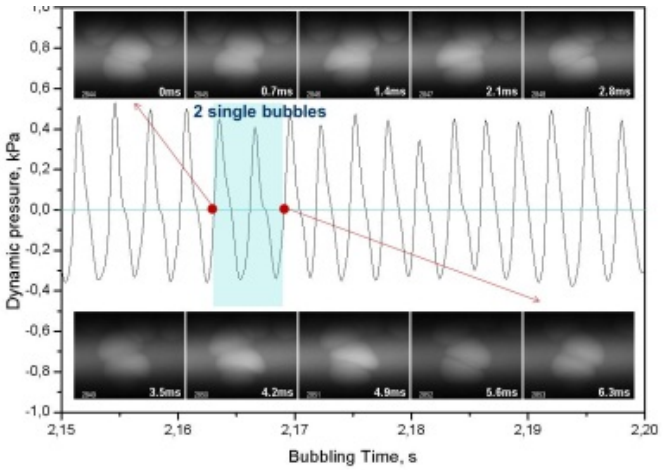
Lab description

Access for basic facilities, equipment, devices etc:

- SEM
- TEM
- AFM
- 3D radioscopy – CT + video speed X-ray camera
- Optical microscopes
- Small angle X-ray and neutron scattering
- Furnaces
- Ultrasonicators
- Self developed electronic and mechanical devices

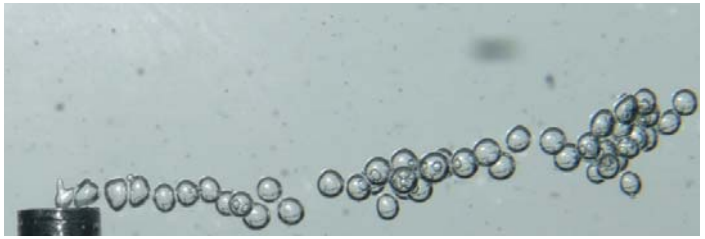
Projects

#1 project :

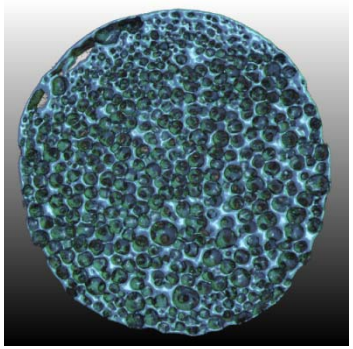


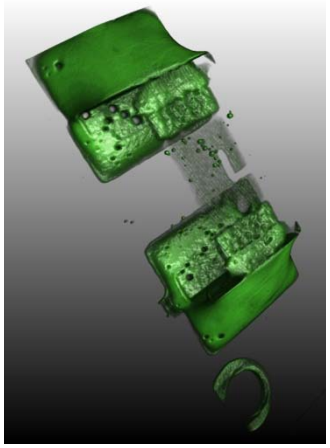
Title: Metal Minipore
Duration: 2 years
Funding organization: European Space Agency
People involved and their function:
1 PhD student experimental
Facilities/equipment: special ultrasonic gas injection device
Most interesting results:

- Development of bubble injection in microgravity
- Foaming of aluminium with submillimeter bubbles through gas injection
- Monitoring of bubble formation in liquid aluminium with 10000 fps



Projects

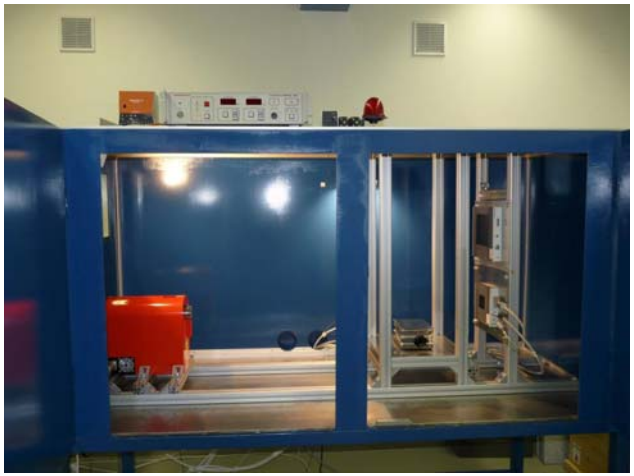




#2 project :

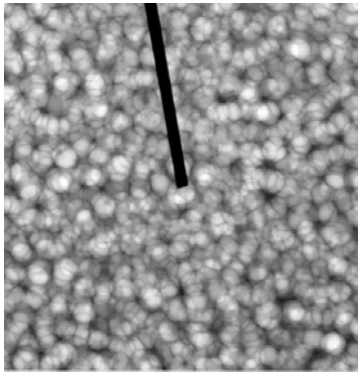
Title: X-ray Camera
Duration: 1 year
Funding organization: NKTH Hungarian Government
People involved and their function:
2 Engineers hardware and software development
Facilities/equipment: 3D radioscope was developed
Most interesting results:

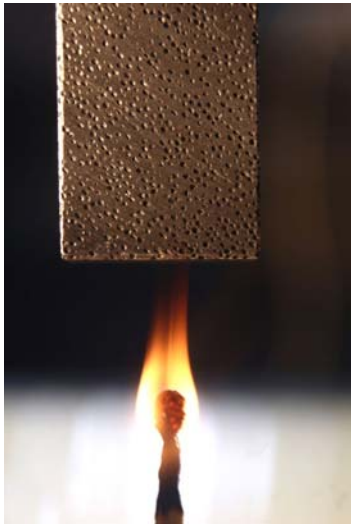
- The device is capable to work both as an X-ray camera and a CT with 5 micron resolution.
- Using the self developed X-ray transparent hot chamber we are capable to monitor liquid metal processes with video speed and cold chamber for snow tomography.



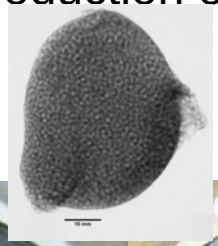
Projects

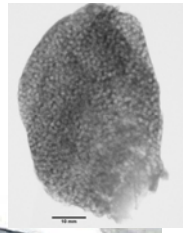
#3 project :

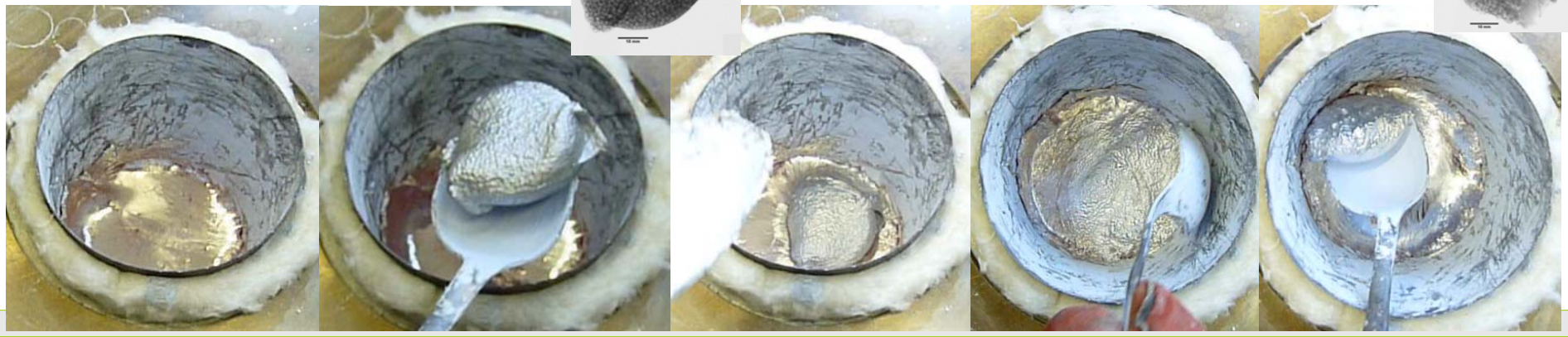




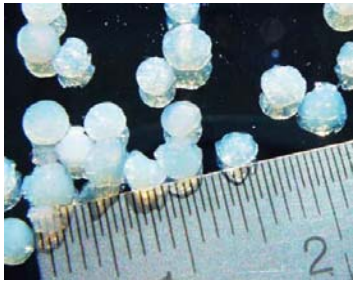
Title: Aluhab
Duration: 2 years
Funding organization: NKTH Hungarian Government
People involved and their function:
1 Postdoc, 2 PhD student
Facilities/equipment: metal foaming equipments
Most interesting results: Production of monodispers, castable, weldable aluminium foam.





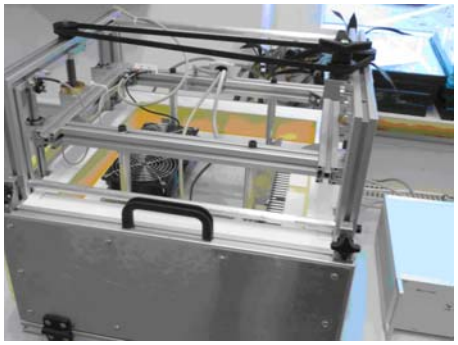


Projects

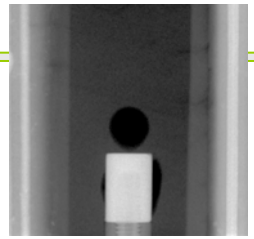


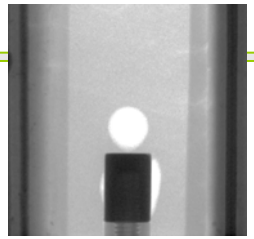
#4 project :

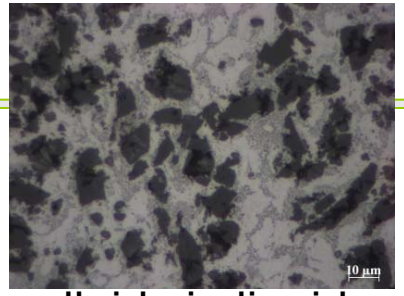
Title: Aerogel filled windows
Duration: 2 years
Funding organization: OroshazaGlass company
People involved and their function:
2 Engineers software and hardware, 1 chemist aerogel rheology
Facilities/equipment: filling and heat conductivity measurement equipment
Most interesting results:
• Filling windows with aerogels
• Development of heat conductivity measurement device for windows



Topics for Research Proposal







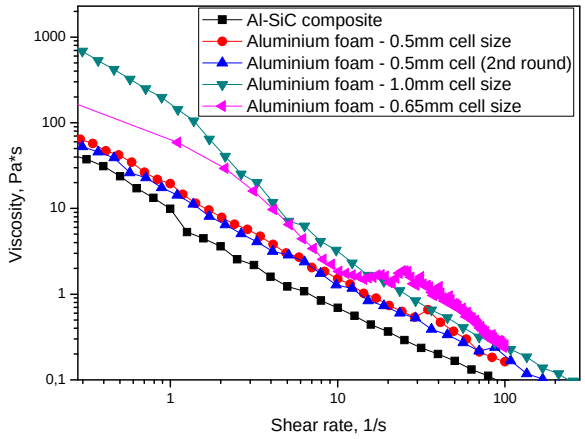
Title: Physicochemical characterization of high temperature colloids in liquid and solid phase

Promotion images & text:
The characterisation of high temperature colloids (metal foams, emulsions, sols and suspensions) from materialographical, rheological point of view wetting, surf. tens, thin film study.

Aluminium foam
Aluminium with steel stregth

Duration: 2 years D.Sc. program of N.B.

Expertise required: Maximum bubble pressure method and foam rheology



Facilities/equipment required:
X-ray camera with high resolution
High temperature rheometer
Metallography and small angle scattering (X-ray, n)

Thank you for your attention