INVITATION

Science Webinars

"LECTURES ON SINTERING"

"SINTERING: DENSIFICATION, GRAIN GROWTH AND MICROSTRUCTURE"

BY

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FunGlass, April 15 – May 15, 2024

PLACE: **Conference room B 4.03 FunGlass TNUAD and online**

These events are organized as a part of the Visiting Scientist programme under the Horizon 2020 project "FunGlass" - grant agreement №739566:

FunGlass – Centre for Functional and Surface Functionalized Glass

&

Alexander Dubček University of Trenčín

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Research Interest:

- **Grain growth and microstructural evolution in polycrystals with change in interface structure and chemistry**
- **Theory and Practice of Sintering – microstructure control and related physical properties**

Supporting partners

Dissemination partners

Funded by the European Union

P R O G R A M

DATE	TIME (CET)	LECTURE
April 17, Wednesday	2:00 p.m. – 4:00 p.m.	Basis of Sintering Science I.
April 19, Friday	10:00 a.m. – 12:00 p.m.	Basis of Sintering Science II.
April 26, Friday	10:00 a.m. – 12:00 p.m.	Bonding and Densification I.
April 29, Monday	2:00 p.m. – 4:00 p.m.	Bonding and Densification II.
April 30, Tuesday	2:00 p.m. – 4:00 p.m.	Grain Growth and Microstructural Evolution I.
May 6, Monday	2:00 p.m. – 4:00 p.m.	Grain Growth and Microstructural Evolution II.
May 7, Tuesday	2:00 p.m. – 4:00 p.m.	Supplementary subjects I.
May 13, Monday	2:00 p.m. – 4:00 p.m.	Supplementary subjects II.

This course is part of a project that has received funding from the **European Union's Horizon 2020 research and innovation programme under grant agreement №739566**

MAIN SEQUENCE/CONTENT OF LECTURES:

Part I. ***Basis of Sintering Science***

- **Brief description of sintering processes and their parameters**
- **Interfacial energy and driving force of sintering**
- **Sintering and polycrystalline microstructure**

Part II. ***Bonding and Densification***

- **Solid state sintering (SSS) Models and Densification**
- Models and kinetics
- Effects of processing variables
- **Liquid phase sintering (LPS) Models and Densification**
- Role of liquid in densification
- Densification kinetics (effects of processing variables)

Part III. ***Grain Growth and Microstructural Evolution***

- **Liquid phase sintering**
- Grain growth in a matrix (Ostwald ripening)
- Effect of interfacial energy anisotropy
- **Solid state sintering**
- Grain growth in a pure and dense system
- Effects of second phase particles and solute segregation
- Effect of pores on microstructure development
- Effect of boundary energy anisotropy

Part IV. ***Supplementary subjects***

- **Sintering of ionic compounds**
- **Diffusion induced grain-boundary migration**
- **Discussion on potential strategies for full densification**

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