

## Press release

Public Defence on 15<sup>th</sup> Dec. 2023

# Step into the fiery embrace of the high-temperature smelting furnace

<b>Title of the doctoral thesis</b>	CFD modeling of multiphase flows in bottom blown copper smelting furnace
<b>Content of the doctoral thesis</b>	<p>In the world of metal-making industries, scientists are always trying to understand how things move inside really hot furnaces. But these furnaces are so hot that it is impossible to monitor what is happening inside. That is where Computational Fluid Dynamics (CFD) comes in—a fancy way of using computer to show how things flow in furnaces.</p> <p>This research is like a computer game for a copper smelting furnace. Based on a furnace model created with a computer, the thesis focuses on figuring out how gases pumped in mix with the super-hot liquid metal, where the fast and slow flowing areas are, and how much the metal hits the furnace walls. A very interesting part is that this 'computer game' is tested with a real experimental water model, and it matches up well!</p> <p>So, this CFD model is a powerful tool for understanding how things flow in different furnaces that use gas blowing systems. It is like unveiling a secret world inside those hot reactors!</p>
<b>Field of the doctoral thesis</b>	Processing of materials
<b>Doctoral candidate and contact information</b>	M.Sc. (Tech.) Kezhou Song kezhousong@gmail.com
<b>Public defence date and time</b>	15 <sup>th</sup> December 2023 at 12 o'clock (in Finnish time)
<b>Remote defence</b>	<a href="https://aalto.zoom.us/j/69282646958">https://aalto.zoom.us/j/69282646958</a>
<b>Place of public defence</b>	Aalto University School of Chemical Engineering, Lecture hall Ke2 (Komppa-Sali), Kemistintie 1, (main door at Biologinkuja) Espoo
<b>Opponent</b>	University lecturer Eetu-Pekka Heikkinen, University of Oulu, Finland
<b>Custos</b>	Professor Ari Jokilaakso, Aalto University School of Chemical Engineering
<b>Link to electronic thesis</b>	<a href="https://aaltodoc.aalto.fi/handle/123456789/51">https://aaltodoc.aalto.fi/handle/123456789/51</a>
<b>Keywords</b>	SKS furnace, Multiphase flow, Multi-Fluid VOF, Standing wave, Model validation, CFD modeling