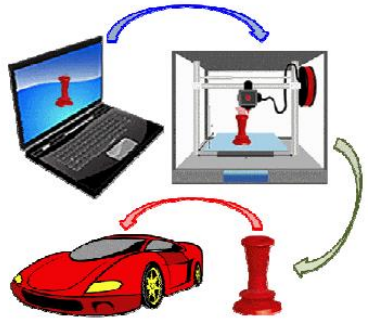
SIRAMM

1st Winter School on

Trends on Additive Manufacturing for Engineering Applications



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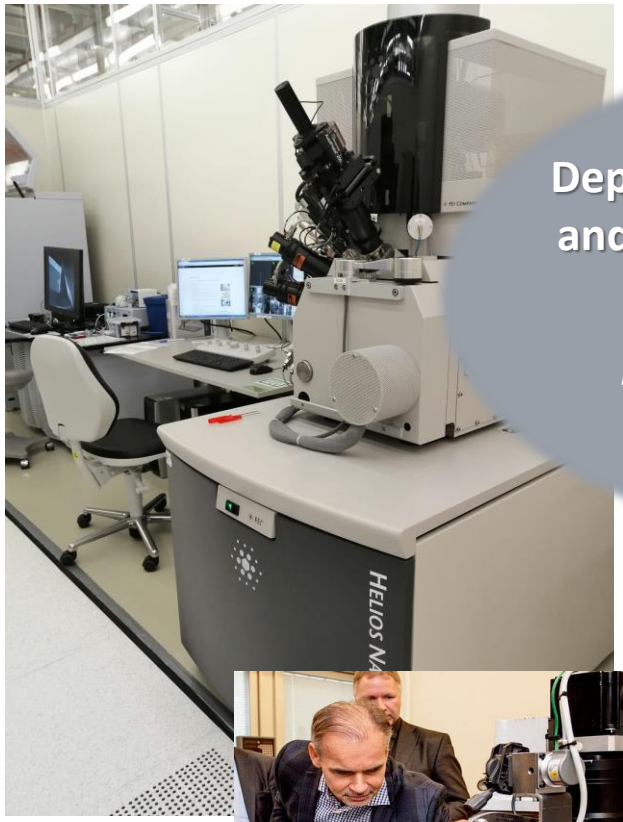
Research topic:

In-situ studies of solid-state welding between Aluminium and Copper at the nanoscale

INSANE

SINTEF

The Research Council of Norway

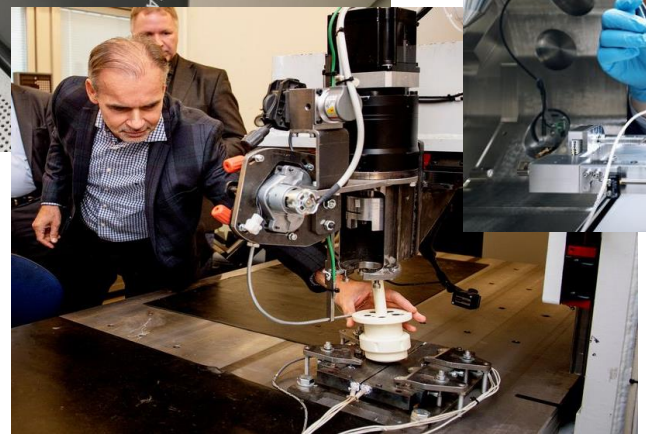


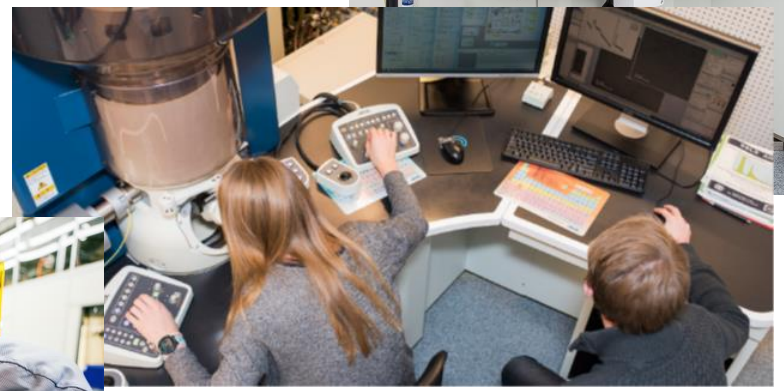
Department of Mechanical and Industrial Engineering

Prof. Filippo Berto
Prof. Øystein Grong
Prof. Jan Torgersen

Department of Physics

Prof. Randi Holmestad
Prof. Per Erik Vullum





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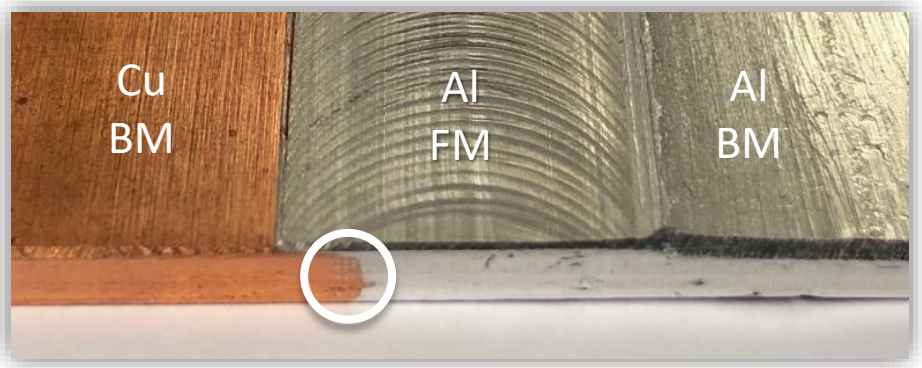
AIM

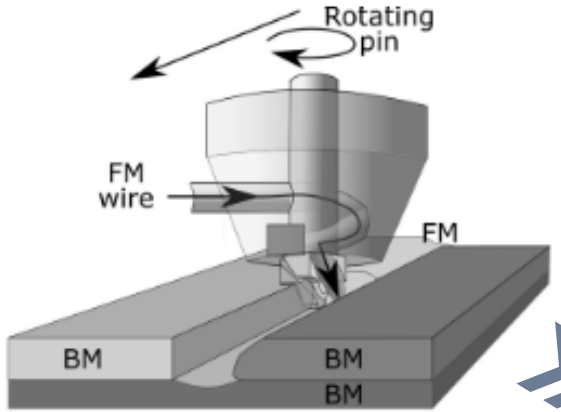
Investigating the **bonding mechanisms** at the interface between the bonded materials

METHOD

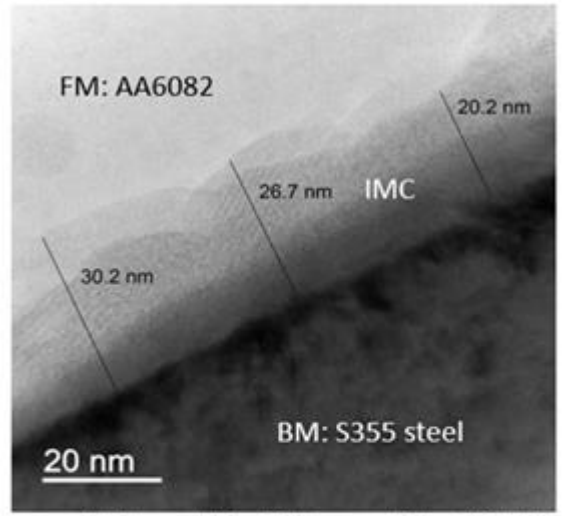
- **Downscaling** HYB welding process at the FIB (*in situ* study)
- **Characterizing** the joint (TEM, conductibility and mechanical nano-testing…)



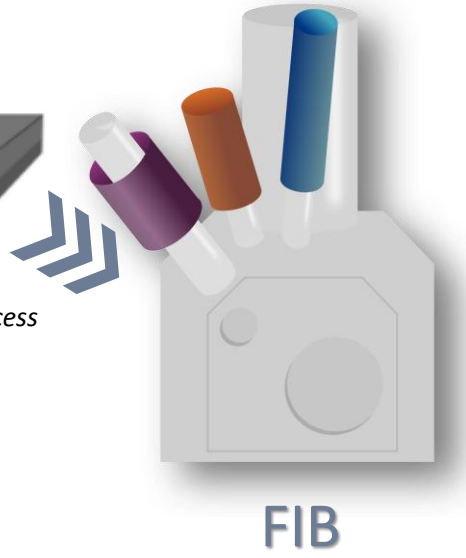
HYB Al-Cu joint, cross-section interface



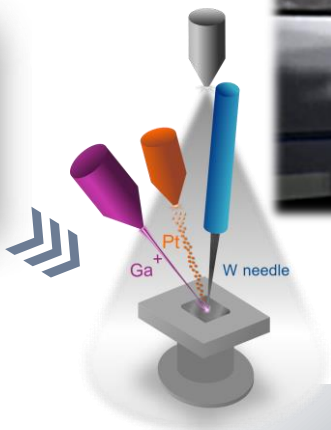
Schematic representation of HYB welding process (Bergh et al., 2020)

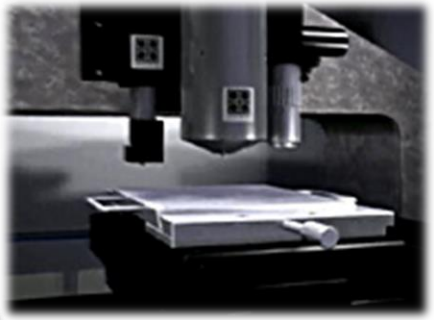


A high resolution TEM image of the HYB Al-Fe interface. The characteristic high bond strength of the HYB Al-Fe joints can be attributed to the formation of a thin (~30 nm) IMC layer containing the elements Fe-Al-Si along the interface.



FIB





Nano triboindenter

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