

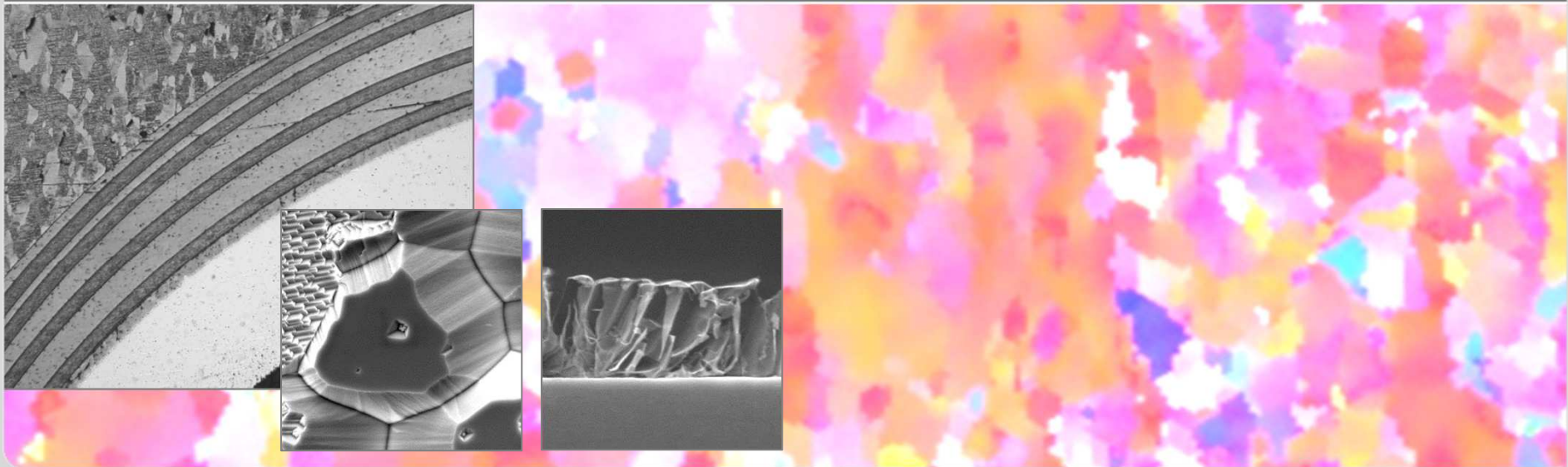
# W Laminate Materials Made of UFG W foil

J. Reiser<sup>1</sup>, A. Németh<sup>2</sup>, S. Bonk<sup>1</sup>, P. Franke<sup>1</sup>, T. Weingärtner<sup>1</sup>, J. Hoffmann<sup>1</sup>, M. Rieth<sup>1</sup>, A. Möslang<sup>1</sup>, D. Armstrong<sup>2</sup>, A. Hoffmann<sup>3</sup>

1) Karlsruhe Institute of Technology, Institute for Applied Materials, Germany; 2) University of Oxford, Department of Materials, United Kingdom; 3) PLANSEE SE, Reutte, Austria

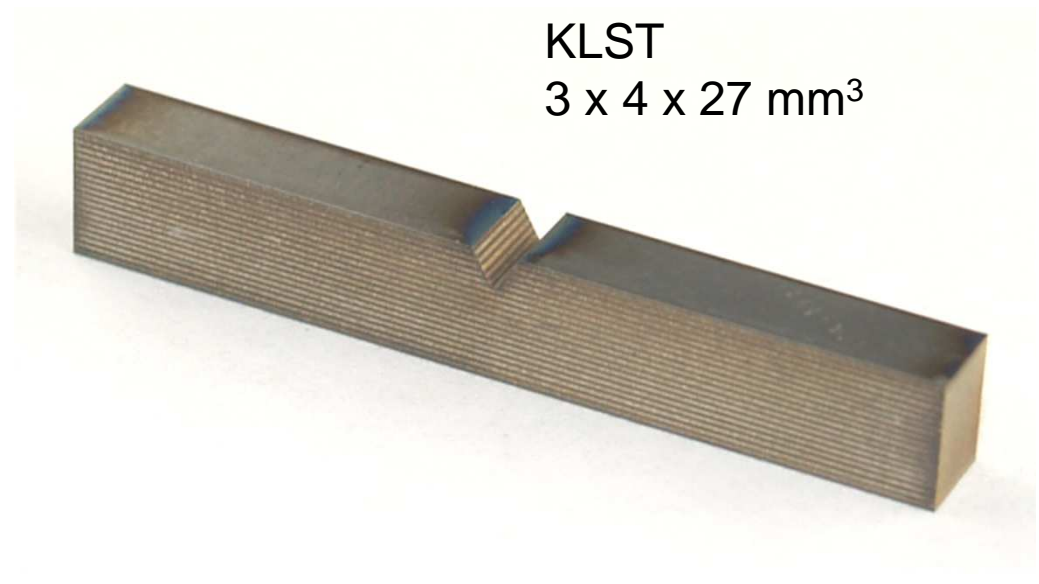
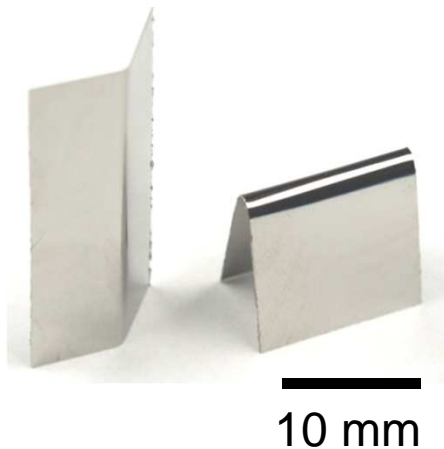
MSE 2014, 23 – 25 Sept 2014, Darmstadt, Germany

INSTITUTE FOR APPLIED MATERIALS, APPLIED MATERIALS PHYSICS



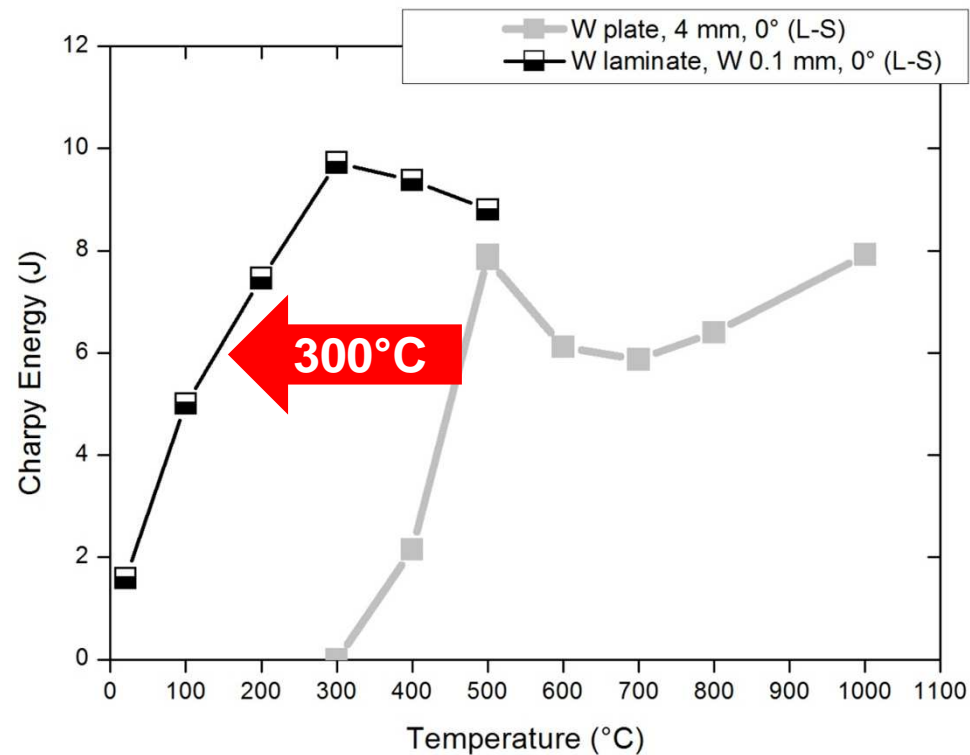
## What is the problem?

- High temperature applications ask for advanced **structural** materials
- W is the metal with the highest melting point of all metals ( $T_S = 3422^\circ\text{C}$ )
- Disadvantages:
  - Low fracture toughness,  $K_{IC}$  [ $\text{MPa m}^{1/2}$ ]
  - High brittle-to-ductile transition temperature (BDTT)



# W laminates: Charpy impact tests

- Can the ductile properties of a W foil be transferred to the bulk?
  - As-received: improvement of 300°C



W laminate with  
AgCu interlayer

# Contents

- Paradoxes of W
- W foil
- W laminate plates
- W laminate pipes