

OBIKAWA LAB.

[Advanced machining/manufacturing processes]

Department of Mechanical and Biofunctional Systems

<http://obikawalab.iis.u-tokyo.ac.jp>

Department of
Mechanical
Engineering

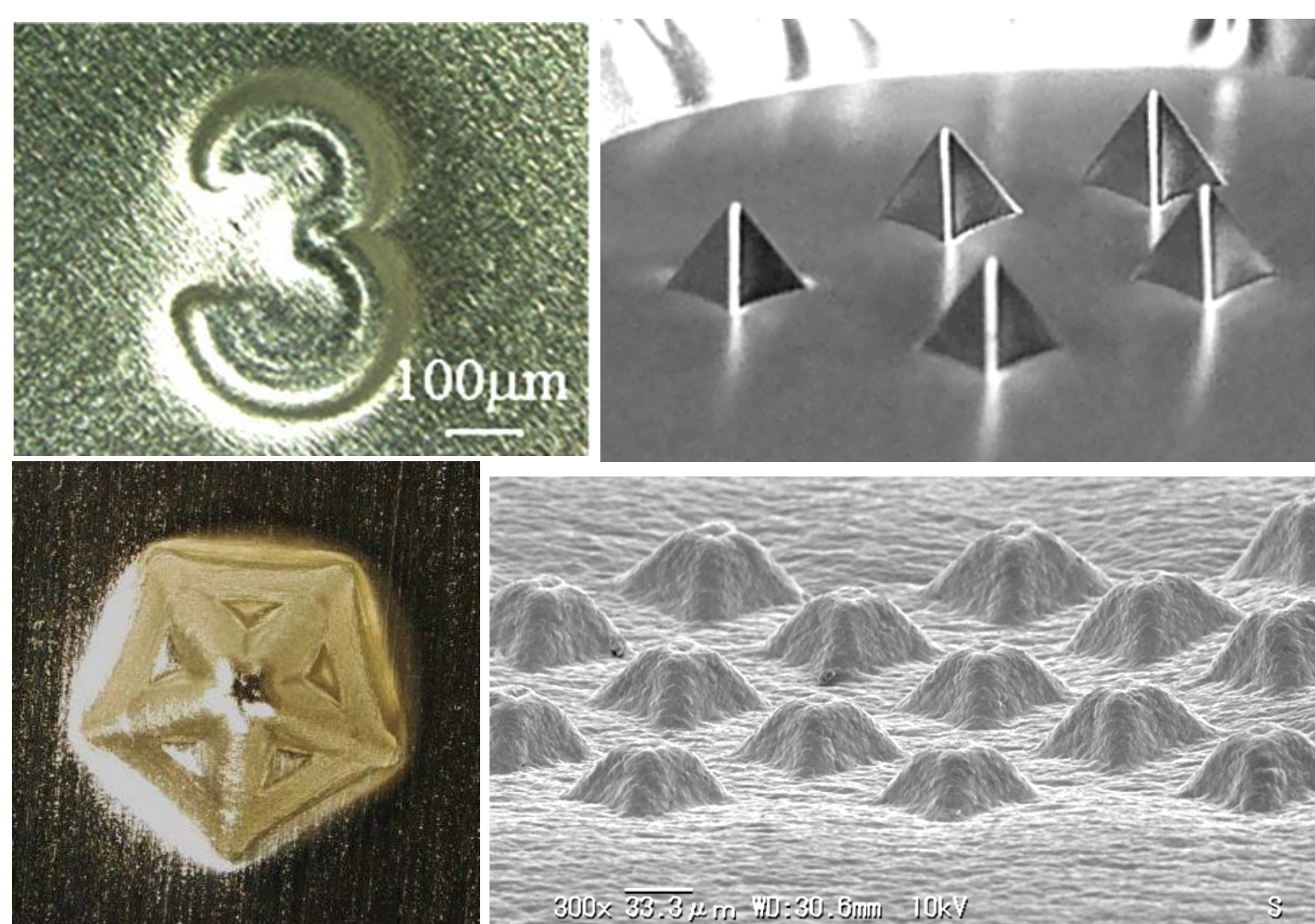
Fine Machining and Fabrication Systems

Fine Manufacturing

Research topics

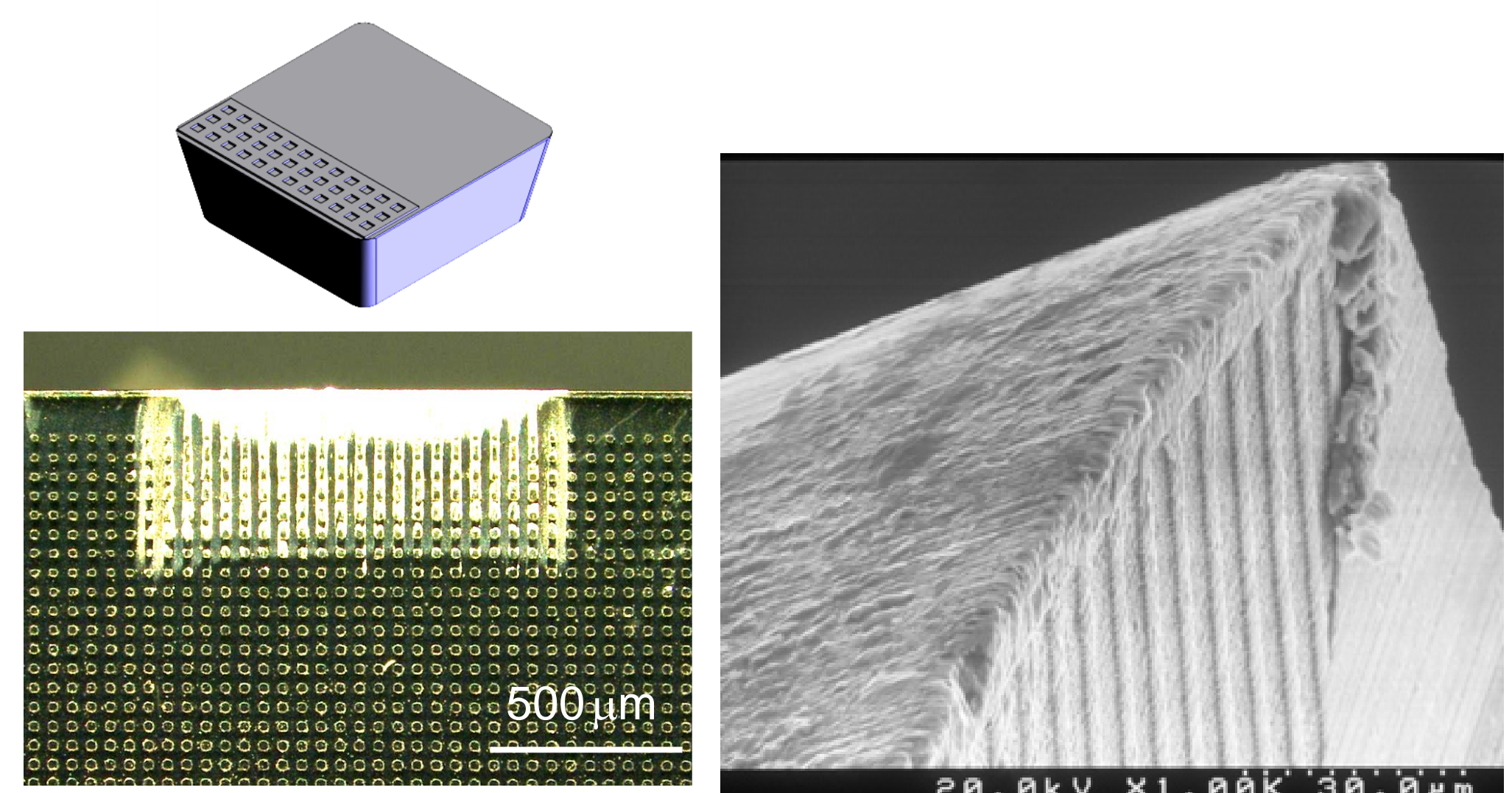
- ◆ Advanced manufacturing technology of aircrafts
- ◆ High-speed and ecological machining of aero-space materials
- ◆ Single point incremental microforming of miniature shell structures
- ◆ High performance tools with micro surface textures
- ◆ Cutting tools with thin film sensors: thermal sensor and stress sensor
- ◆ Multi-physics analysis of machining

1. Single point incremental microforming of miniature shell structures



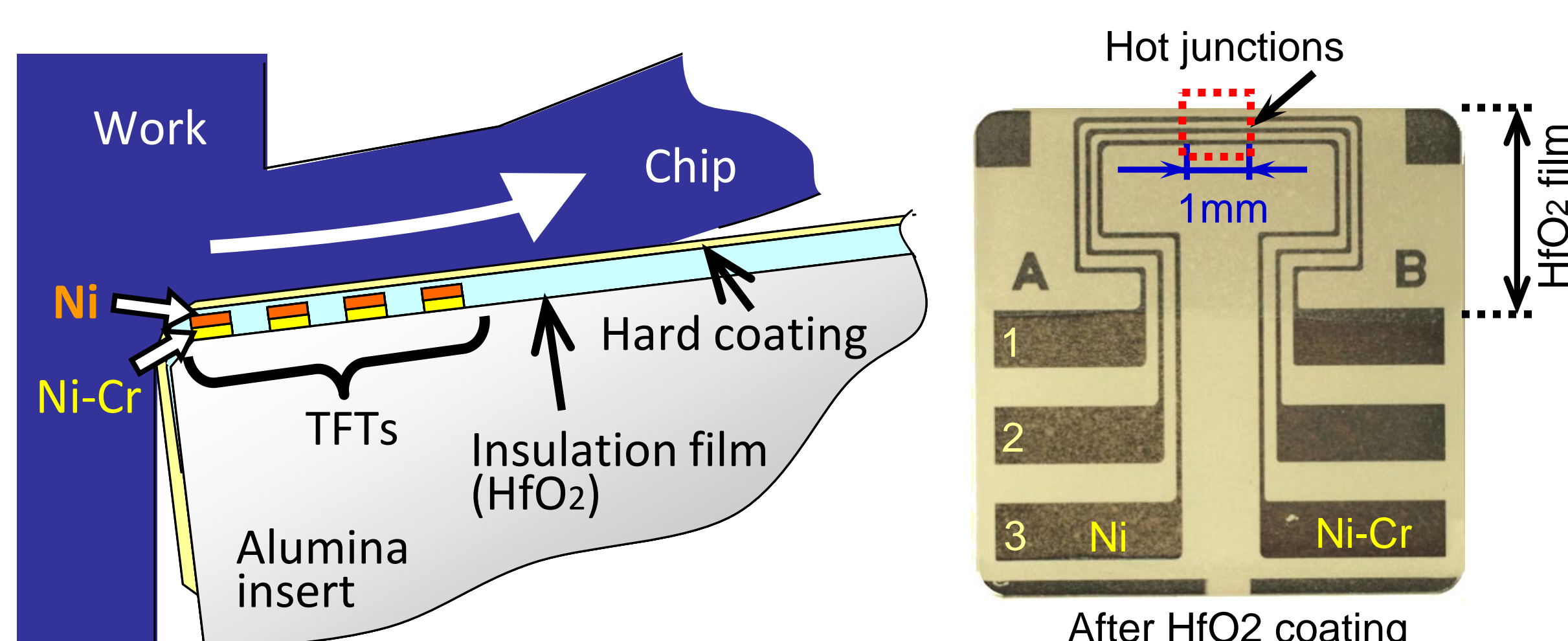
Miniature shell structures of aluminum foil and an array of thin-shell micropyramids of ceramic (lower right)

2. High performance tools with micro surface textures



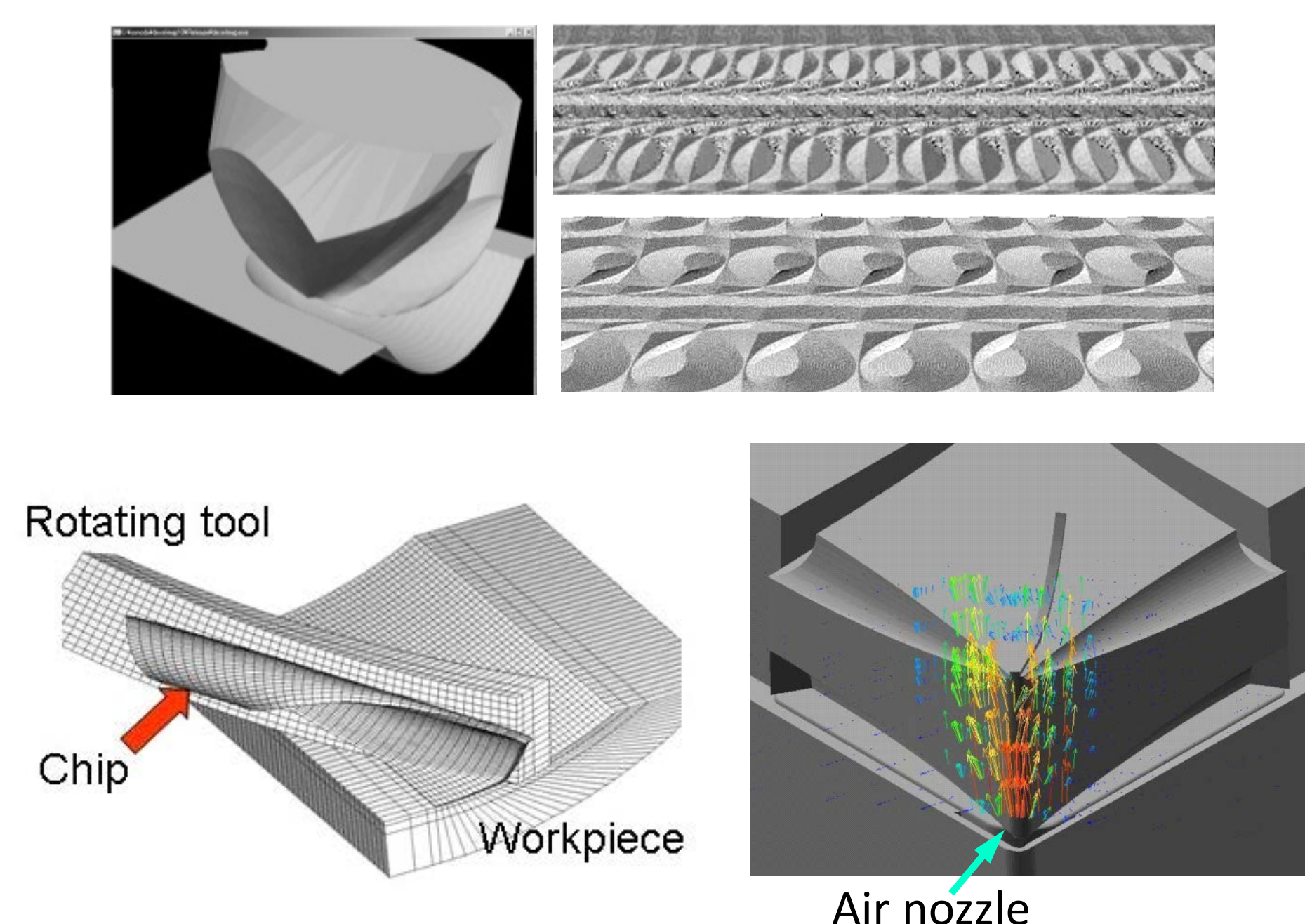
Micro surface textures on the tool face (after machining)

3. Cutting tools with thin film sensors (Thermal sensor)



Tool with thin film thermocouples (TFTs): Schematic (left figure) and a tool insert developed for orthogonal machining (right figure)

4. Multi-physics analysis of machining



Ball end milling (upper), end milling (lower left) and MQL turning (lower right)