DIGIMU® predicts microstructural evolutions occurring during thermomechanical processes and heat treatments of metallic alloys.

**GENERATE REALISTIC POLYCRYSTALS**

Give a grain size distribution, a second phase particle distribution and a dislocation density distribution, or import it from experimental data.

**PREDICT GRAIN GROWTH**

Driven by capillarity forces, and stored energy gradient at the interfaces.

**KEY BENEFITS**

- Enhance products' quality
- Assist developments of high-end alloys
- Import initial microstructure directly from micrograph
- Control grain size
- Understand the impact of second phase particles
- Predict abnormal grain growth
- Master industrial growth

**KEY FEATURES**

- Documented procedure to identify growth and recrystallization parameters
- Unique AAA remeshing (automatic - adaptive – anisotropic)
- Model recrystallization phenomena occurring during metal forming processes
- Intuitive graphical user interface
- High parallel computing compatibility
- Continuous flow from the DIGIMU industrial chair research results

**PINNING ON PRECIPITATES DRIVEN BY CAPILLARITY**

Dragging forces on grain boundaries directly driven by capillarity pressures due to second phase particles curvature.

**MODEL HARDENING, RECOVERY, STATIC DYNAMIC AND POSTDYNAMIC RECRYSTALLIZATION**

Simulate polycrystal deformations, hardening and recovery, nucleation, and following nuclei growth.

**Visualization of recrystallisation on a 304L austenitic stainless steel during hot forming and controlled cooling**

**Anisotropic Automatic Adaptive mesh generation at grain boundaries and around second phase particles**
The History of DIGIMU®

The DIGIMU® software is rooted in research results from the DIGIMU consortium and the ANR Industrial Chair, handled by CEMEF, Armines Mines ParisTech, with 8 renowned French industrial partners and Transvalor.

The ambitious goals of the DIGIMU Consortium with a budget of 1.23 million euros imply a strong academic challenge. This consortium combines the development of innovative digital methods, metallurgical models, experimental work, expertise and feedback from the companies involved. The software was first released commercially in 2016 and was the prize-winner of the 2017 Trophies of numerical simulation, organized under the Teratec Forum in the category ‘Collaboration’.

Who is DIGIMU® for?

The DIGIMU® software is dedicated

• to newcomers who want easy and didactic interactive first steps in microstructural studies,
• to specialists who want a framework to test and enhance models and predictions.

The solution responds to the different pressing needs of the manufacturing industry and more specifically, the high-tech materials sector:

• target and define experimental campaigns more easily,
• improve the understanding of observed phenomena by numerically testing the physical assumptions put forward,
• improve the accuracy of predictions to constantly extend the thermomechanical fields of use of the targeted materials,
• improve responsiveness to new markets,
• contribute to material design.