What makes the pipeline dense?

Stefan Janacek, uni software plus gmbh
Andreas Binder, MathConsult GmbH

Modern pipelines for natural gas are made of heavy steel plates (in German: “Grobbleche”) that have to stand mechanical (pressure), thermal and possibly chemical (if the natural gas is very sour) loads. To obtain a highly resistant heavy plate, the crystallization and the history of phase changes between different steel phases (austenite, martensite) has to be controlled tightly via sophisticated cooling and reheating loops.

In voestalpine’s R&D project “Platemod”, different model hierarchies and simulation tools have been and are further developed for laboratory and for production environments, for office simulation and for online control.

Stefan Janacek:

- 2008 Promotion am Institut für theoretische Physik der Johannes Kepler Universität Linz, zum Thema ab-initio Simulationen von Molekülen und Clustern in starken Magnetfeldern mit Hilfe der Dichtefunktionalstheorie (Titel der Dissertation: "Fast and accurate algorithms for Density Functional Theory calculations of clusters and molecules in strong magnetic fields")
- 2008-2009 PostDoc/Universitätsassistent am Institut für theoretische Physik der Johannes Kepler Universität Linz
- 2009-2010 PostDoc am Institut de Ciencia de Materials de Barcelona: Dichtefunktionalstheorie für periodische Systeme in starken Magnetfeldern (Hofstadter Butterfly, Quantum Hall Effect)
- 2010-2011 PostDoc am Instituto de Ciencia de Materiales de Madrid

- Seit 2011: MathConsult GmbH (Industriemathematik, Finanzmathematik), RICAM (Radon Institute for Computational and Applied Mathematics, part of the Austrian Academy of Sciences), uni software plus GmbH (senior developer)