**Name:** Oleg SHCHYGLO
**Nationality:** Ukrainian
**Education:**
Masters degree in Physical and Biomedical Electronic from Sumy State University in Ukraine.
PhD in Physics and Mathematics from the Kurdiumov's Institute for Metals Physics, National Academy of Sciences of the Ukraine.
**Previous employment:**
Kurdiumov's Institute for Metals Physics, National Academy of Sciences of the Ukraine.

**Starting date in MULTIMAT:** 1st of October 2007.
**Duration:** 12 months.
**Category:** ER
**Place**: LEM ONERA-SNRS, Chatillon, France

Before starting with MULTIMAT I was intensively working on the study of strain-induced effects at order-disorder phase transitions in binary alloys in collaboration with Max-Plank-Institute for Metals Research in Stuttgart.

Within the MULTIMAT network I work with Dr. Alphonse Finel on a completely new to me topic: theoretical study of the microstructure formation at martensitic phase transformations in Ni-Ti alloy. Ni-Ti is not only the most known shape memory alloy for industrial applications, but also the system, showing many intriguing physical properties, which are still not well understood despite the intensive study for almost half a century.

The starting point in my research is to develop the appropriate free energy functional for the Lagrangian dynamics modeling in order to simulate the cubic-to-monoclinic phase transformation which occurs in Ti-Ni and is the key to its shape memory properties. The next step is to adopt the parameters of the free energy functional such, that it describes elastic properties of all phases which occur at the austenite-martensite transformation in Ni-Ti alloy. These should allow to simulate the microstructure formation in Ni-Ti alloy at various conditions. Because the information, needed for my study was not fully present in literature, working within the MULTIMAT Network allowed me to access the recently obtained experimental data of various groups which work on Ni-Ti and helped a lot in my research. Because Ni-Ti is a complicated system, the ability to exchange knowledge with other researchers in the Network is a tremendous speed up in my study and the meetings organized by MULTIMAT Network provide excellent opportunity for such exchange.