

# **Nano-Grid: A grid application for Nanoscale Science, Education in nanoscience and industry branches based on nanotechnology**

## **Summary**

Nanoscience involves the basic building blocks and length scale of matter in biology, chemistry, physics, and engineering. This common feature in scale in all the traditional research disciplines requires a cross-disciplinary approach to research in nano scale science. Creating the necessary support tools for more efficient large collaborations in this emerging interdisciplinary topic, and thus offering new kinds of possibilities for groups to work together, is of fundamental importance to the future of science and technologies. The lessons learned in the education, outreach and information sharing in the field of nanoscience can be applied to support other emerging multidisciplinary research collaborations.

Nano-Grid will provide advanced development environments for facilities to explore nanoscience phenomena at multiple scales, for computational nanoscience tools, facilities for sharing nanoscience resources among the community in a seamless manner and collaboration tools that enable geographically distributed teams to interact without barriers.

## **Visions**

### **Grid Instrumentation:**

With significant investments in nanotechnology instrumentation, an impressive array of expensive analysis and fabrication devices are now available to researchers. However, these resources are largely localized and the primary usage model is one of physically traveling to a nanosciences center. Grid instrumentation has the potential to facilitate interdisciplinary use of nanoscience instruments. The accessibility to reliable, state-of-the-art, user-friendly, well-documented remote instrumentation through standard Web browsers shares nanoscale science over a large number of nanoscale sciences laboratories.

Nano-Grid will allow researchers of different fields to perform and monitor experiments remotely at other nanoscience centers. The interoperability of high level research instruments will speedup nanoscience research and connect industrial partners to state of the art nanoscience devices. The nano-grid services will open instrument leasing for industrial purpose.

### **E-Science and Nano Education:**

Nanoscale Science needs a new academic environment without barriers between traditional disciplines. The emphasis will be on the education of a new generation scientists and engineers who highly appreciate inter- or cross-disciplinarity, and on a environment where the advancement of women is encouraged. Nano-Grid will integrate knowledge bases from different research centers with highly interactive e-learning material.

Nano-Grid will support the interaction of interdisciplinary teams and it will provide a basis for the education of a strong future generation of nanoscience researchers and engineers. A platform network between research institutions and industry will enable the new key technology in the everywhere in the European community.