Exploring the Nanotechnology Landscape
The ZRL S&T Effort

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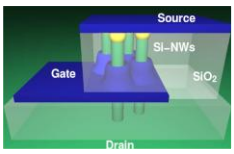
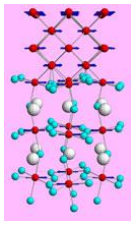
On a first approach nanotechnology can be seen as an extension of current processes and device dimensions from the micrometer to the nanometer scale. In this sense downsizing CMOS technology plays a central role for the next generation of IT components. Nanoscience however exploring materials on the atomic or molecular level is leading not only to new concepts in electronics but is opening a fundamentally new field for materials and components with new functionality. The ZRL Science and Technology group is exploring new device concepts and structures, methods of atomic manipulation, and nanoscale fabrication and demonstrates the power of computational materials science. The selection of projects which will be presented consists of examples for exploratory and application oriented research.

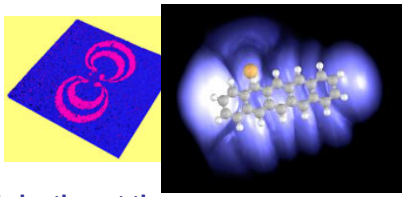
ZRL Science & Technology

- **Semiconductor Technology**
  - **Materials for future CMOS**
  - **Ultimate transistors**



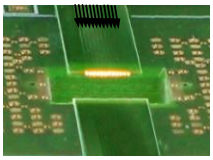


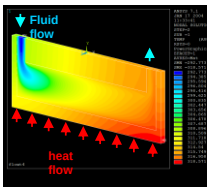
- **Beyond the Transistor (the Next Switch)**
  - **Molecular electronics**
  - **Nanoscale science**
  - **Magnetism/Spintronics**



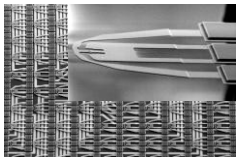
- **Fabrication at the nanometer scale**

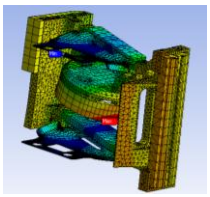
- **Systems technologies**
  - **Heterogeneous integration**
  - **Optical interconnects/photonics**
  - **Thermal management**





- **Micro-/Nanomechanics**
  - **Probe-based storage**
  - **Tape**





- **Biotechnology**