KnowARC

KnowARC Solutions for Society and Industry

University of Lübeck

University of Geneva

Science+Computing, Tübingen

Reasons to fund Grid Computing

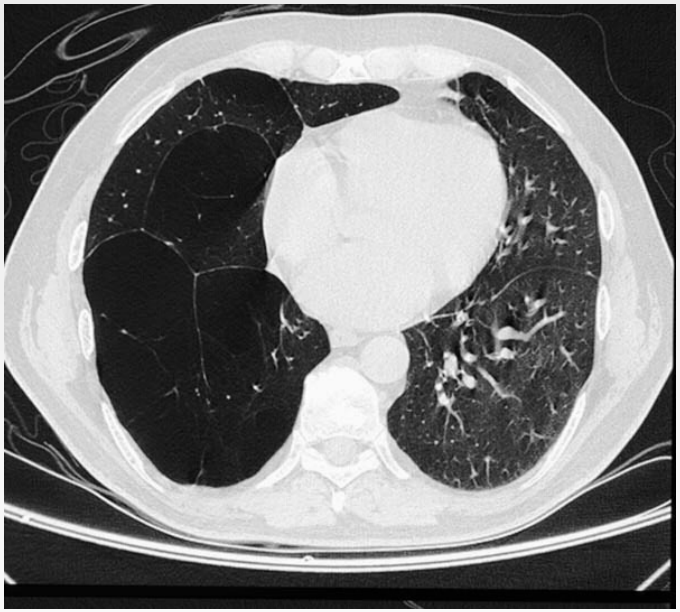
KnowARC

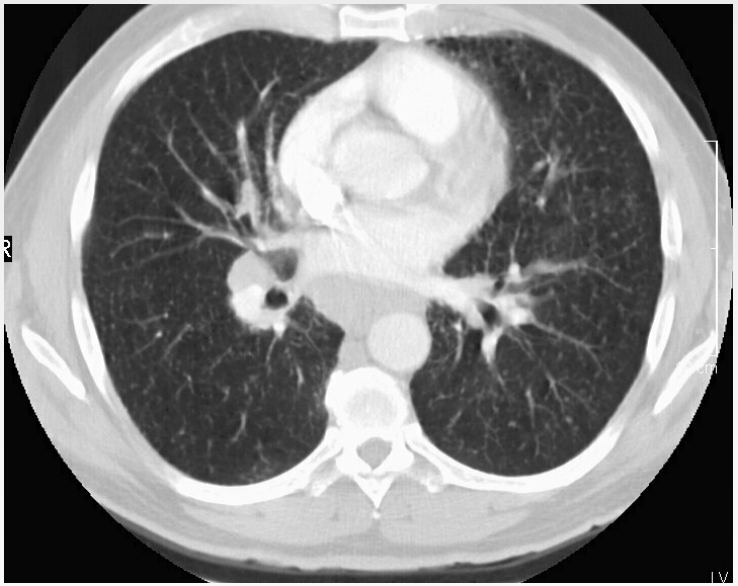
- Sharing resources across frontiers
  - geographic / political
  - academic disciplines
- Fostering unplanned collaborations
  - affects any institution
  - eases research and information exchange
- Exchange of KnowHow
  - industrial services
  - pan-european projects

Dissemination

- Past
  - Computional grids strong in physics
  - Reluctance in other communities
    - Security risks
    - Technical overhead
    - Focus on integrating web services
- Addressing new Communities
  - Geneva: Hospital
  - Lübeck: Bioinformatics
  - Tübingen: Automotive Industry

- Computer Aided Diagnosis of Lung Diseases





Geneva

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- Knowledge transfer
  - from archives to doctors
  - between doctors
  - between countries
- Reference implementation
  - Involving many thousand CPUs
    - currently mostly idling for text editing
    - performs in security-sensitive area
  - New community

- Workflows in Automotive Industry
  - Serious industry in Germany and Sweden
  - Many design and engineering companies collaborate
    - long design circle (3-5 years)
    - many standards
    - difficult communication
    - shift of innovation from car producer to suppliers

Source: http://conferences.esa.int/isd2001/lousin/lousin/

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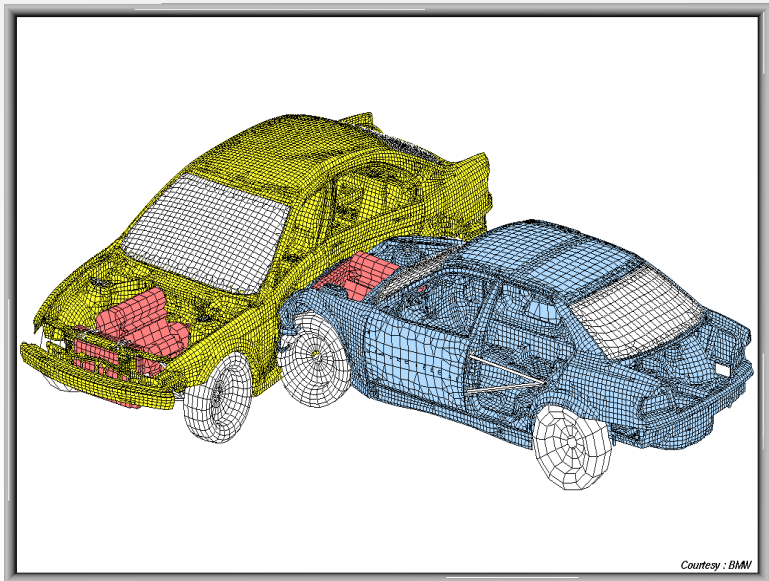
- Model application: Crash simulation
  - Many contributors
    - multiple departments
    - external contractors
  - Intense computational effort
  - Licensing issues
  - Workflow Modelling



Lübeck

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- Statistical genomics
  - Addressing animal models of complex genetic diseases
    - genetic disease: gene variant causes physiological dysfunction
    - complex: more than single gene
    - animal model: non-human with the same disease
  - Avalance of wet-lab data
    - Gene expression data (up to 50K/patient)
    - SNP data (500K/Patient)
    - Disease information for 120+ patients

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- Challenges
  - Find genes responsible for disease
  - Statistics brings constraints on
    - Chromosomal loci associated with disease
    - Interaction of loci for phenotype
  - Bioinformatics adds
    - Molecular pathways
    - Promoter analysis

Summary

- 3 Tasks
  - Beneficiaries of the KnowARC developments by ourselves and our partners
  - Communicators to our respective communitites
  - Hopefully: Incentive to all you NorduGridders to
    - Continue the fine work
    - Donate and raise CPU power