



IT4Innovations Centre of Excellence

Supercomputing for Applied Sciences

Ivo Vondrak

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<http://www.it4innovations.eu>

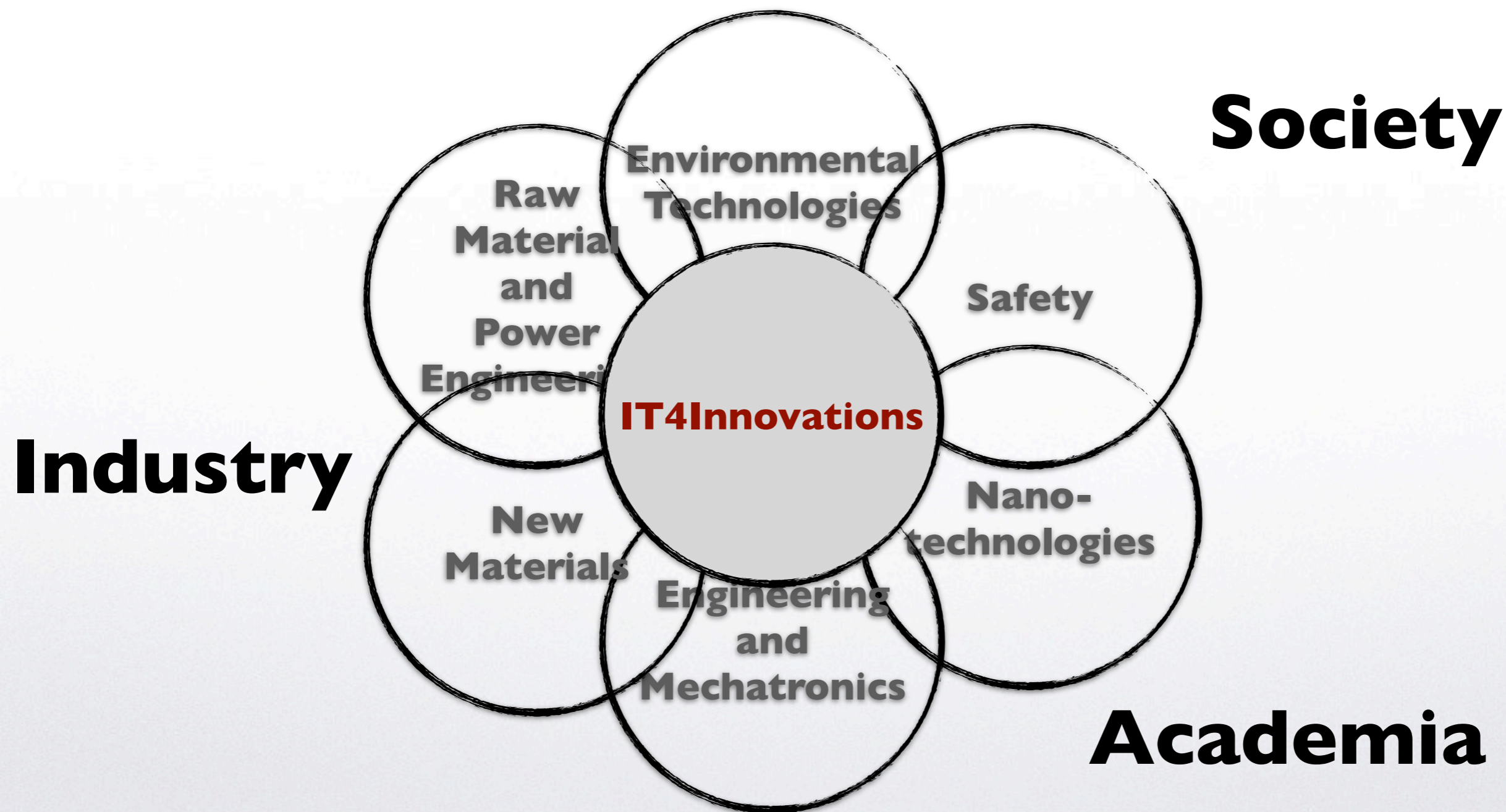
Motto

**The best way to predict your
future is to ~~create~~ it ...
simulate**

Abraham Lincoln

Ivo Vondrák based on
Abraham Lincoln

Research Context



Vision and Mision

- **Unify a wide range of fields of knowledge and science around the central theme of supercomputing and information technologies**
- **Society:** Floods and Polution Modeling, Traffic Monitoring and Management, Disaster Management, ...
- **Industry:** Power Engineering and Heavy Machinery, Automotive Industry, Nanotechnology, ...
- **Academia:** Open Access, Projects of National Importance, ...

Research Programs

Applied and Basic Research

IT4People

IT for Disaster and Traffic Management

Multimedia Infor. Recognition and Presentation

SC4Industry

Numerical Modeling for Engineering

Libraries for Parallel Computing

Modeling for Nanotechnologies

Theory4IT

IT for Knowledge Management

Softcomputing Methods with Supercomputer Applications

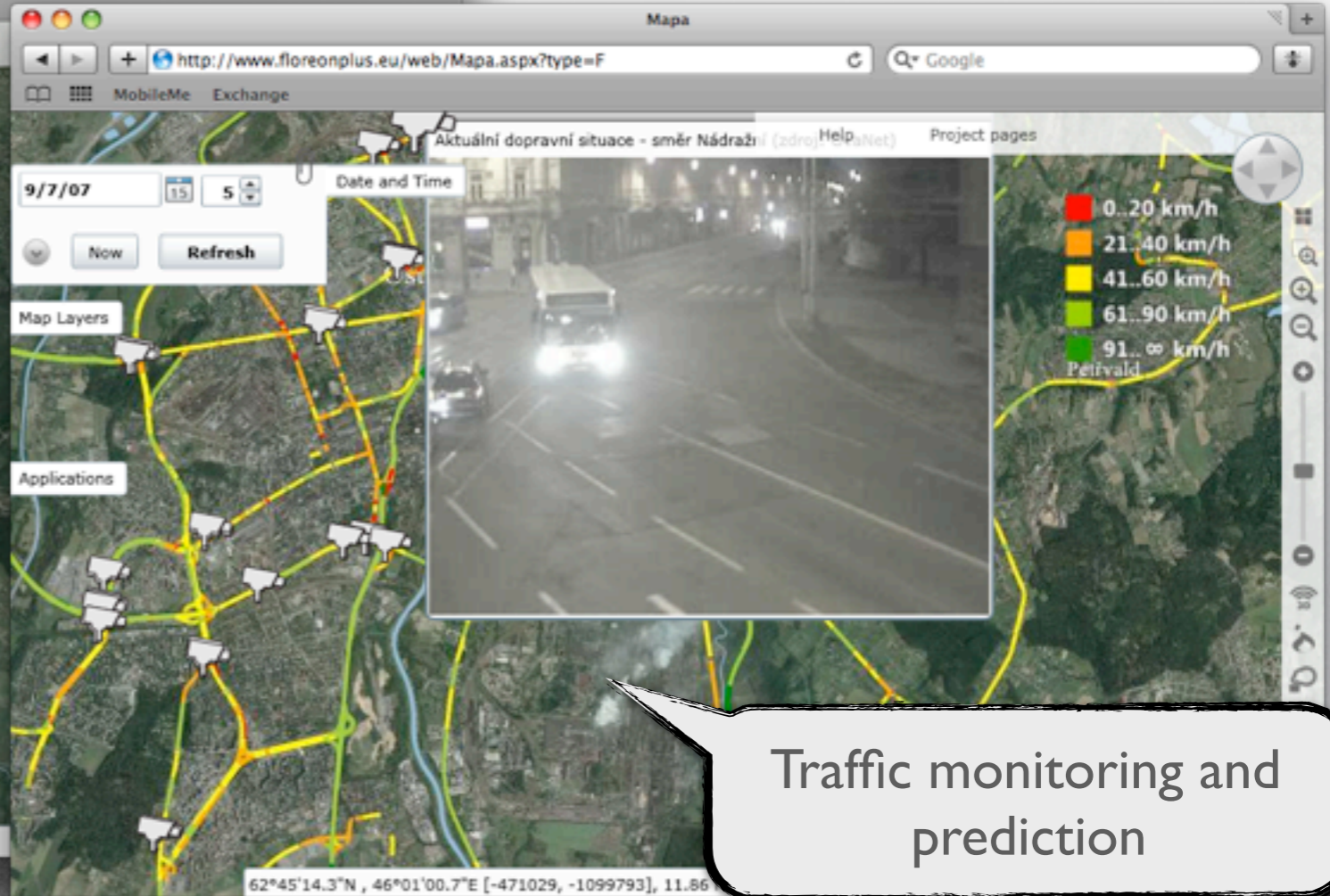
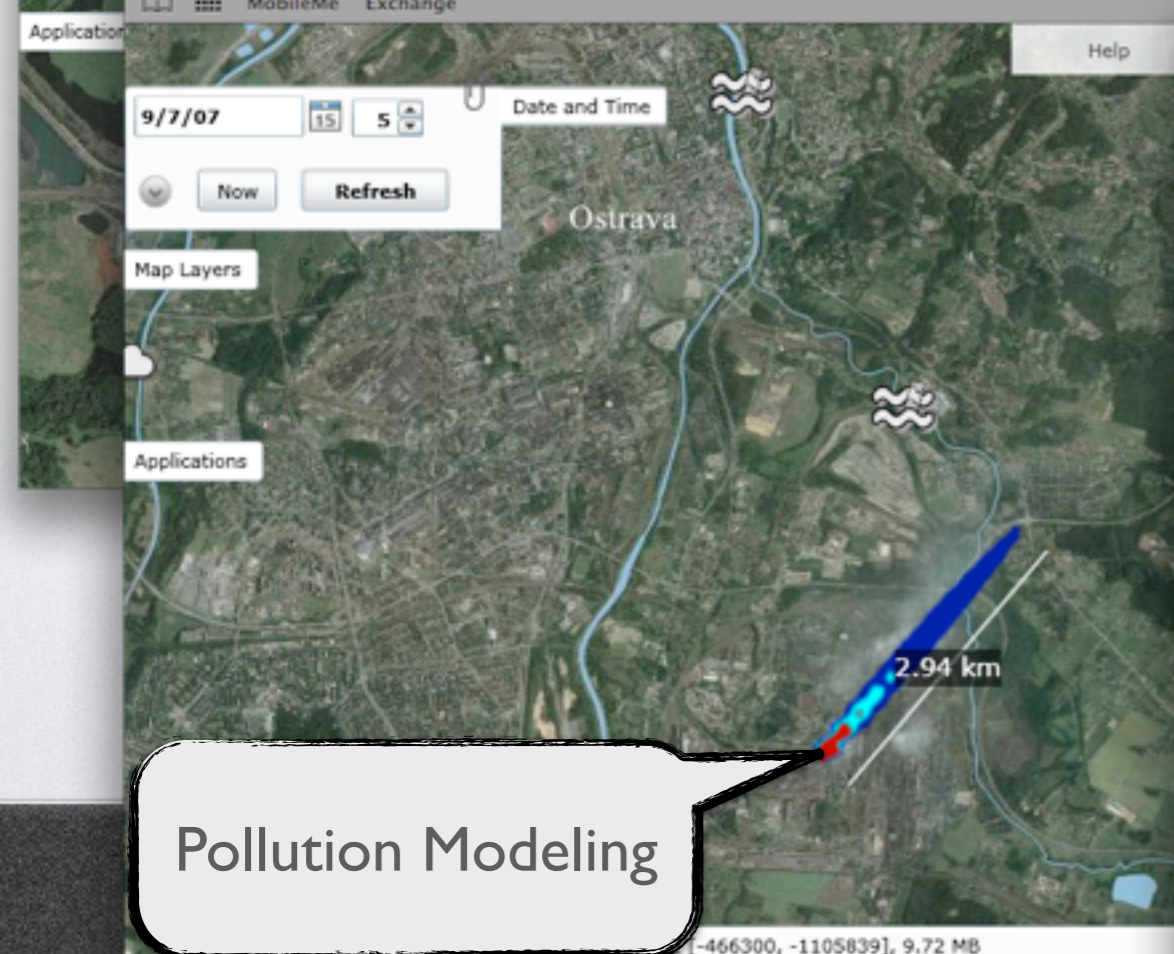
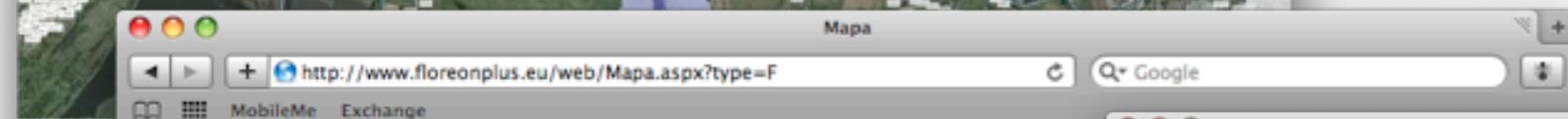
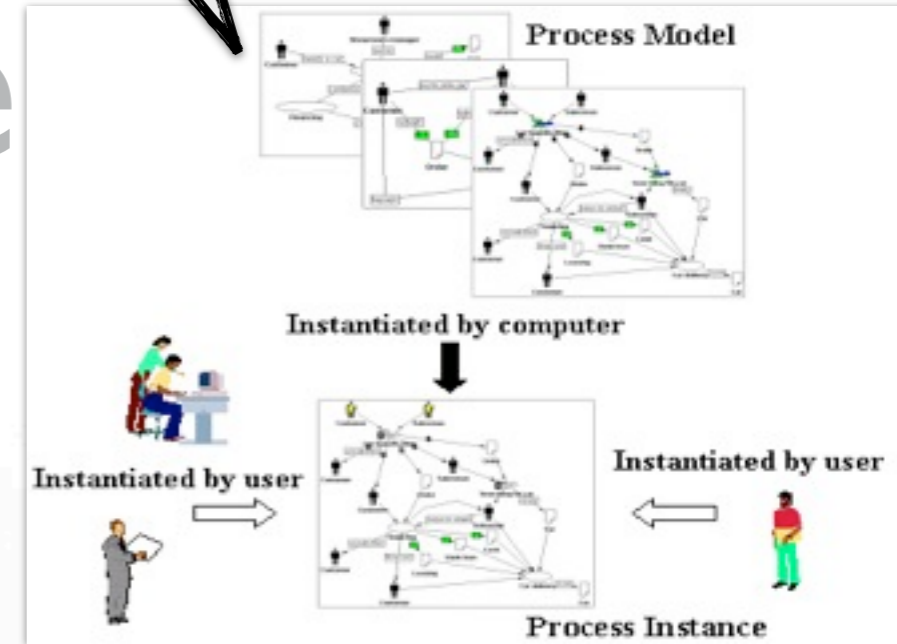
Secure and Safe Architectures, Networks and Protocols

Supercomputing Center

eInfrastructure

IT4People

Floods modeling and simulation
www.floreonplus.cz

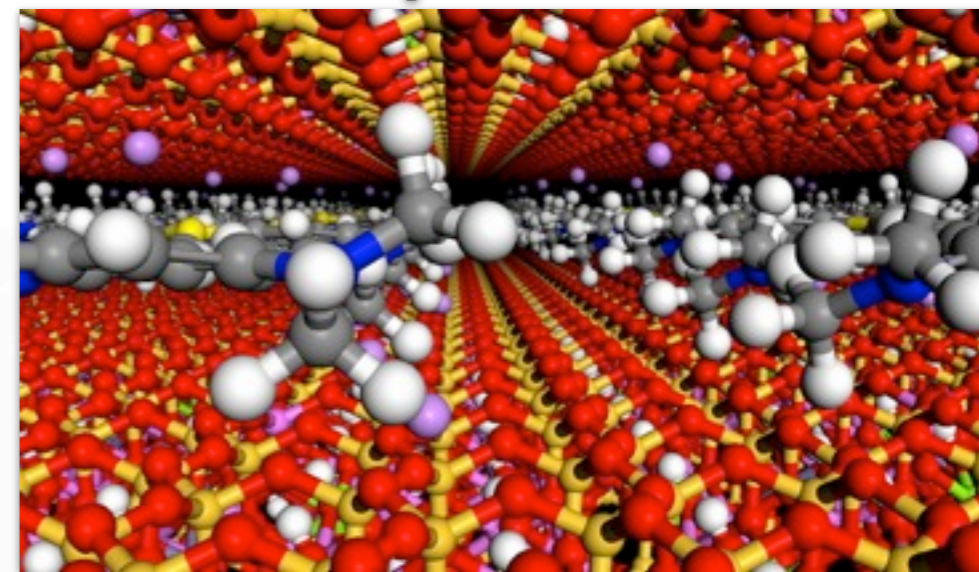
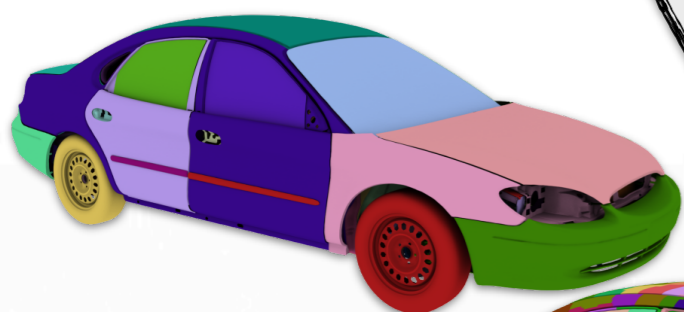


Pollution Modeling

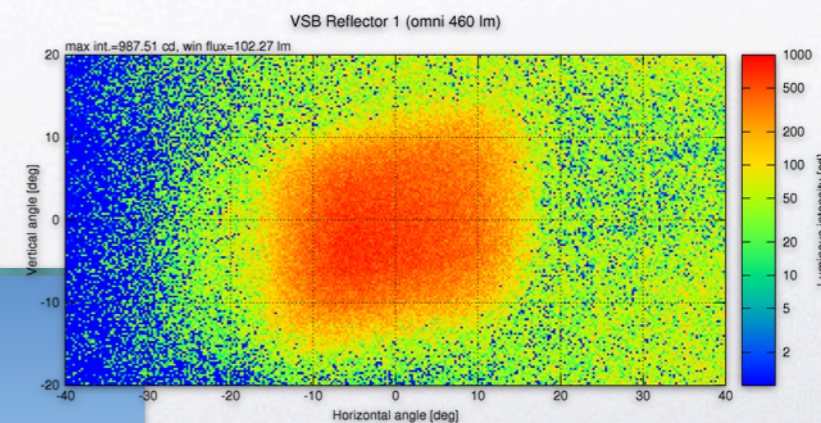
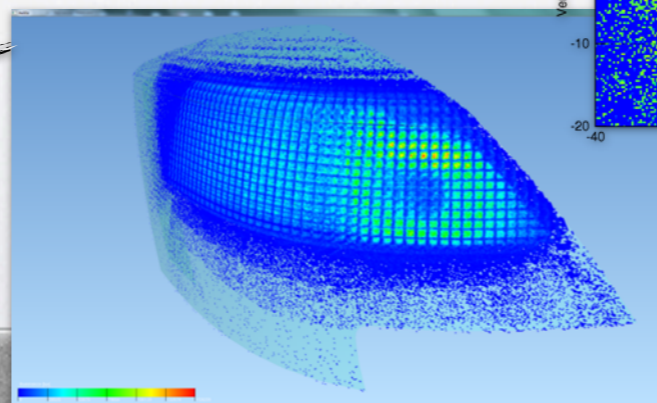
Traffic monitoring and prediction

Scalable parallel solvers
based on domain
decomposition

SC4Industry



Ray tracing in head light
design



Theory4IT

- **IT for Knowledge Management:** processing of extensive collections of weakly structured data, knowledge extraction from data, use of dimension reduction methods for high-dimensional data, use of linear algebra methods, neural networks, statistical methods, and cluster methods for data analysis.
- **Soft Computing Methods with Supercomputer Applications:** mathematical theory of fuzzy approximation, formal methods for the representation of knowledge burdened with uncertainties.
- **Secure and Safe Architectures, Networks, and Protocols:** contemporary security and reliability-focused IT research.

Main Characteristics

- **1 PFLOPS Supercomputer (TOP50-100) in 2014**
- **Business model**
 - 50% internal access for own research programs including contract research with external institutions
 - 30% open access for external institutions based on “grant“ competition
 - 20% dedicated access for projects of national importance
- **Personnel: 200 employees (= 150 FTE)**
 - 20 management positions, jobs in services, and systems administration.
 - 80 research positions
 - Key senior researchers connecting the computer science/technical side and the application/scientific side
 - 100 PhD students and postdocs
- **Education and training in scientific computing**
- **IT4I as a national HPC center**
 - Member of PRACE (Partnership for Advanced Computing in Europe) since 2010 (Tier I)

Main page | Contacts | Media&Marketing | Český | Recommend 120



IT4Innovations

Centre of Excellence

Computing for life | Information society
Supercomputing
Theory for IT

- What is IT4Innovations
- Research domains
 - IT4People
 - SC4Industry
 - Theory4IT
- Technologies and equipment
 - Supercomputer
 - What is Supercomputer/HPC
 - Why have a supercomputer
 - Hardware
 - Software
 - Calculations and results
- Project partners
- Contacts
- Image gallery
- News & Events
- Official reports

01/05/2012 | **The Czech Government to Finance IT4Innovations' Membership in the Prestigious PRACE International Network**
Stemming from a decision reached in December 2011, the Government of the Czech Republic approved financial aid for the PRACE project within support provided to large infrastructure projects focused on research, experimental development and innovation.

01/05/2012 | **Annotations of instruments (and complex technologies)** 
Attached you will find basic information concerning the planned procurements for instruments, in accordance with articles 8.5 – 8.9, Annex no. 2 of Guide for applicants and beneficiaries of OP RDI.

12/09/2011 | **Research Council of IT4Innovations**
On December 6, 2011 took place the first meeting of the Research Council of IT4Innovations.

12/08/2011 | **DHI and IT4Innovations Initiate Collaboration**
In connection with the official opening of IT4Innovations,

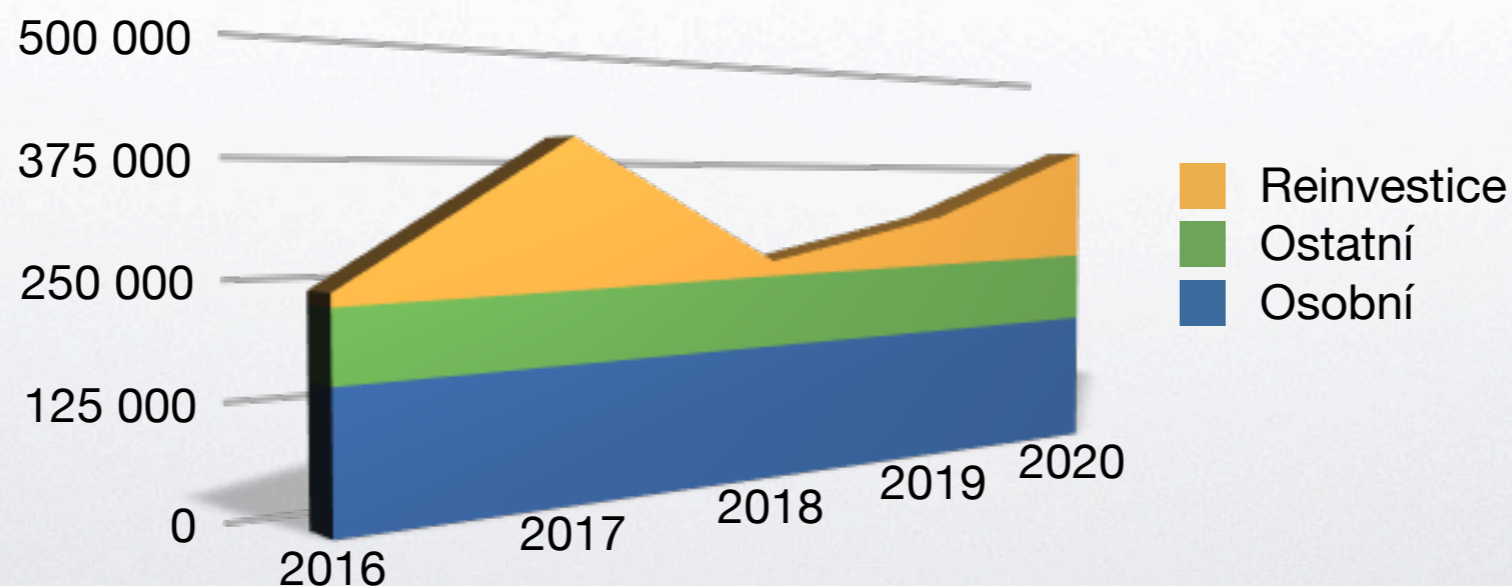


www.it4innovations.eu
 www.it4i.eu
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 www.it4i.cz

Náklady

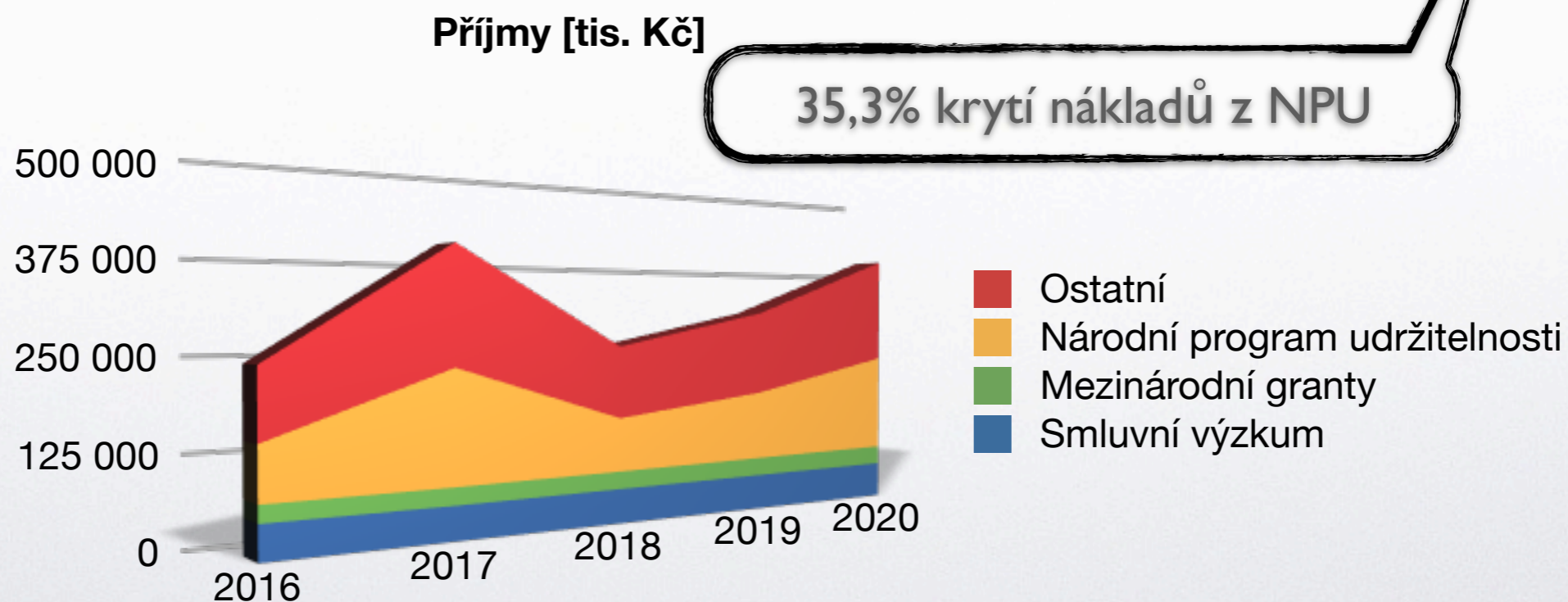
| Náklady | 2016 | 2017 | 2018 | 2019 | 2020 | Celkem |
|--------------------|----------------|----------------|----------------|----------------|----------------|------------------|
| Osobní | 150 550 | 153 971 | 157 612 | 161 016 | 164 745 | 787 894 |
| Ostatní | 77 875 | 80 732 | 84 220 | 86 570 | 88 716 | 418 113 |
| Reinvestice | 14 124 | 167 354 | 17 600 | 61 648 | 143 766 | 404 492 |
| Celkem | 242 549 | 402 057 | 259 432 | 309 234 | 397 227 | 1 610 499 |

Náklady [tis. Kč]



Základní udržitelnost

| Příjmy | 2016 | 2017 | 2018 | 2019 | 2020 | Celkem |
|-------------------------------|----------------|----------------|----------------|----------------|----------------|------------------|
| Smluvní výzkum | 48 000 | 48 000 | 50 000 | 52 000 | 54 000 | 252 000 |
| Mezinárodní granty | 23 510 | 24 810 | 25 810 | 27 350 | 28 890 | 130 370 |
| Národní program udržitelnosti | 74 198 | 161 018 | 78 395 | 104 016 | 150 965 | 568 591 |
| Ostatní | 96 841 | 168 229 | 105 228 | 125 869 | 163 372 | 659 538 |
| Celkem | 242 549 | 402 057 | 259 432 | 309 234 | 397 227 | 1 610 499 |



Udržitelnost

| Příjmy | 2016 | 2017 | 2018 | 2019 | 2020 | Celkem |
|-------------------------------|----------------|----------------|----------------|----------------|----------------|------------------|
| Smluvní výzkum | 48 000 | 48 000 | 50 000 | 52 000 | 54 000 | 252 000 |
| Mezinárodní granty | 23 510 | 24 810 | 25 810 | 27 350 | 28 890 | 130 370 |
| Národní program udržitelnosti | 148 396 | 322 036 | 156 789 | 208 031 | 301 930 | 1 137 182 |
| Ostatní | 22 643 | 7 211 | 26 833 | 21 853 | 12 407 | 90 947 |
| Celkem | 242 549 | 402 057 | 259 432 | 309 234 | 397 227 | 1 610 499 |

Příjmy [tis. Kč]

71% krytí nákladů z NPU

