

## **What is “Distributed Computing”?**

- scientific calculations and simulations are becoming bigger and bigger
- high demand of scientific calculations nowadays
- Solution 1: Super Computers
  - processing time is very expensive
  - too many calculations for super computers
- Solution 2: Network of private computers
  - private computers are idle most of its on-time  
(writing letters and surfing the internet do not require 3GHz and/or multi core CPUs)
  - network of millions of private computers is more powerful than the biggest super computer
  - marginally error-prone; nearly limitlessly expandable
  - cheaper for scientists to use for their calculations
  - publicity for scientists / research is closer to the people who benefit from its results (e.g. cancer patients)

## **Going into detail**

- working since end of 1990's
- large range of scientific fields using DC
  - biology, chemistry, biochemistry, mathematics, physics, astronomy, etc.
- already notable results and a lot of scientific publications
- best known and first project:
  - SETI@Home (Search for Extra Terrestrial Intelligence)
- biggest project (concerning processing power):
  - Folding@Home (1,6 PFLOPS<sup>1</sup>; faster than TOP10 super computers together (~1.4 PFLOPS); first project using Playstation3
- presently 126 different projects listed
- most projects are using the BOINC (Berkeley Open Infrastructure for Network Computing) platform (all BOINC-projects together ~1.0 PFLOPS)
- over 1.5 million people with over 3 million computers participate world wide

## **What is “Rechenkraft e.V.”?**

- team at most projects
- community exchanging its experiences in DC
- giving free help concerning DC
- running its own DC projects since 2007 (e.g. porting other projects to BOINC platform)
- worlds first and biggest incorporated society aiming to publish the idea of distributed computing (founded 2005)
- currently 51 signed members

## **How you can participate**

- download and install BOINC at <http://boinc.berkeley.edu/download.php>
- choose a project (<http://www.rechenkraft.net/wiki/index.php?title=Projektübersicht>)
- do not be afraid of asking for help at [www.rechenkraft.net](http://www.rechenkraft.net)

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<sup>1</sup> PFLOPS – PetaFLOPS – quadrillion ( $10^{15} = 1.000.000.000.000.000$ ) floating point operations per second. As a comparison an Intel Pentium 4 CPU has got 3.1 GigaFLOPS which are about 0.000 003 PFLOPS