

# *Modelling, Analysis and Computing*



Self-evaluation 2005-2010

Barry Koren, 13 May 2011

# Position

- Applied mathematics, in direct cooperation with practice  
(perfect fulfilment CWI mission)
- Blossoming and flourishing
  - Making success of CWI-theme *Earth and Life Sciences*
  - World leading in e.g. computational plasma physics (lightning phenomena, e.g.)
  - Very broad, growing network of research contacts, nationally and internationally
  - Strong financial position overall
  - ~ 20 (full-time-CWI) PhD degrees
  - Tenure-track and full-professor appointments
  - CWI-fellows, knighthoods and other awards

# *Dynamics in research*

- Life Sciences group MAC4
  - Started 2009 as pilot, since 2010 regular group
  - Young, enthusiastic and rapidly growing
  - Bio-systems modelling, cancer combinatorics and statistics, a.o.
- New research topics MAC1,2,3
  - Modelling population and vegetation dynamics
  - Cloud-convection parametrization
  - Control of major dike heights
  - Computational economy and financial engineering
  - Integrity quantification of solar and wind powered electrical networks
  - Computational wind-farm aerodynamics
  - Computational tokamak plasma physics
  - Modelling and computing discharges in high-voltage technology
  - Computational tomography

# Existing funding sources

## ● NWO

- 2 Vidi
- Free Competition
- Program *Feedbacks in the Climate System*
- Program *Computational Life Sciences*
- Program *Complexity*

## ● National technology funds

- STW program *Multiscale Simulation Techniques*
- STW program *Building on Transient Plasmas*
- IOP program *Electromagnetic Power Technology*

## ● EU

- Programs *ICT* and *IST*
- *Marie Curie* and *Erasmus Mundus*

# New funding sources

## ● Other national funds

- Netherlands Consortium and Netherlands Institute for Systems Biology (NCSB, NISB)
- Netherlands Bio-Informatics Centre (NBIC) program *Biorange*
- National physics (FOM) program *Control of Burning Plasmas*

## ● Direct

- Rabobank
- Netherlands Bureau for Economic Policy Analysis (CPB)
- Energy Research Center of the Netherlands (ECN)
- Nuclear Research and Consultancy Group (NRG)
- ASEA Brown Boveri (ABB)
- Philips Lighting
- ...

# Cooperations

- Inside CWI:
  - between all MAC groups
  - and with other CWI groups (SEN3, SEN4, PNA6, INS3)
- Outside CWI, over wide range:
  - from **medicine** (NKI) to **nuclear engineering** (ITER)
  - from **oceanography** (NIOZ) to **option pricing** (Rabobank, ING)
  - from **economic policy making** (CPB) to **electrical engineering** (ABB, Philips)
  - ...

# Cohesion

- Real-world applications:
  - Underlying applied mathematics
  - Organizational aspects
- Applied mathematics:
  - **Existing:** numerics and analysis
  - **New:** stochastics and combinatorics (opportunities PNA cooperations)

# Ambitions

- Further strengthening research in themes
  - Life
  - Earth
  - Energy
- Remain strong in fundamentals of numerics  
(heart of most of our algorithms)
- Educate and scout new top talents
- Et cetera