NTNU

Norwegian University of Science and Technology

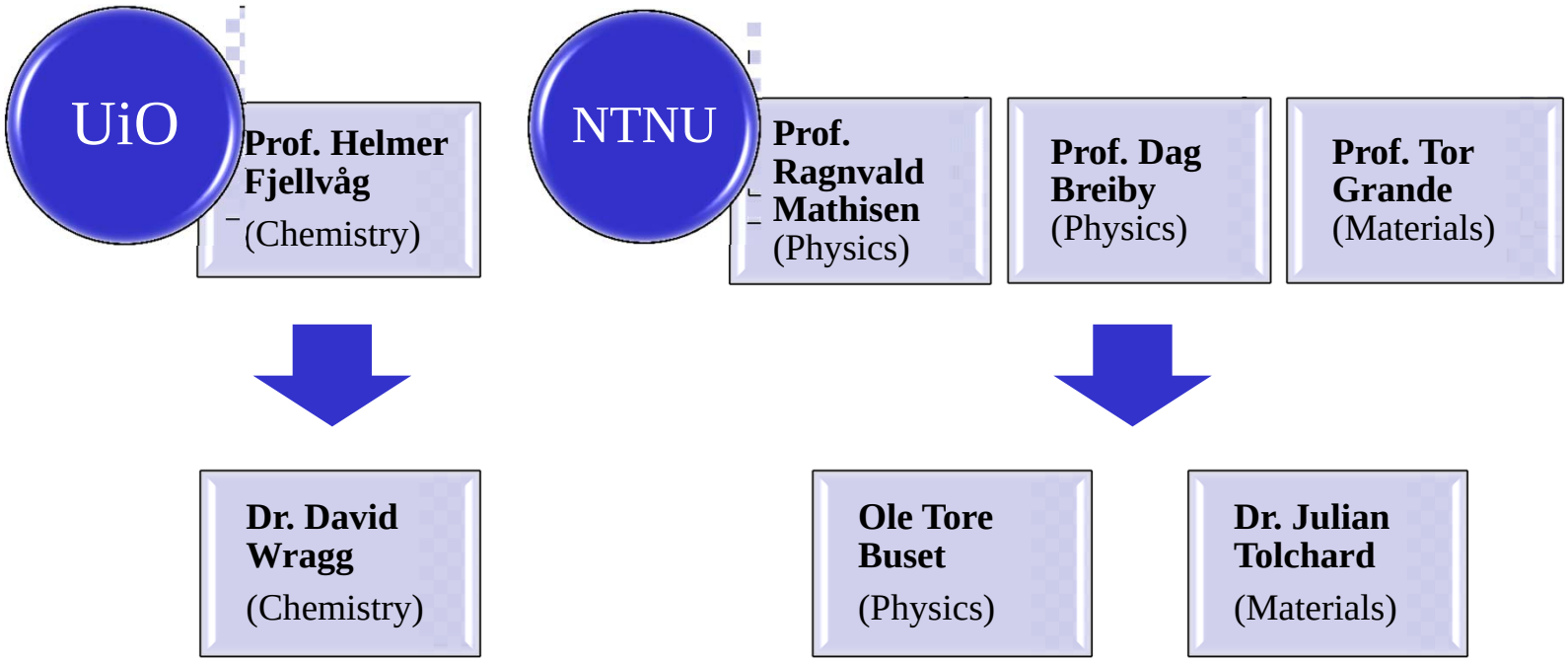
# RECX – An update on the national centre

Julian Tolchard

# What is RECX

- Norwegian Centre for X-ray Diffraction, Scattering and Imaging REsource Centre X-rays
  - Admittedly not a very "catchy" name
- Virtual centre across UiO and NTNU
- Funded jointly by Forskningsrådet, UiO, and NTNU
  - 25.5 MNOK from Forskningsrådet
  - >20 MNOK from UiO and NTNU
- New equipment / personnel
- "Donation" of existing equipment to centre
- 5 year commitment (initially)

# Who is RECX?


UiO
Prof. Helmer Fjellvåg
(Chemistry)
NTNU
Prof. Ragnvald Mathisen
(Physics)
Prof. Dag Breiby
(Physics)
Prof. Tor Grande
(Materials)
Dr. David Wragg
(Chemistry)
Ole Tore Buset
(Physics)
Dr. Julian Tolchard
(Materials)

# What are the goals?

- Improve competence in x-ray scattering/imaging
- Maintain and expand academic use of x-ray methods
  - Both at lab scale and at major central facilities
- Direct use of the infrastructure by external users:
  - 4 universities and colleges
  - 3 research institutes
  - **8 Norwegian companies**

# RECX Roadmap (2012)

- We are up and running now
  - Three established, well equipped labs
- Equipment tenders in process
  - Decision Nov/Dec 2012
  - Installation spring/summer 2013
- Website early 2013 (www.recx.no)
- Be fully operational by 2014
- Workshop early 2014
  - Show off our full capabilities

# Capabilities

- Powder Diffraction at UiO & NTNU
  - High throughput, high resolution
  - Cr, Cu, Mo radiation / reflection and transmission geometry
- Single Crystal Diffraction at UiO
  - Structure evaluation and solution
  - Micro-samples
- SAXS (particle size/shape) at UiO & NTNU
  - 1D and 2D
- Thin film analysis at UiO and NTNU
  - GID, reflectometry, 2D SAXS
- Micron resolution tomography at NTNU
- Design your own experiment…

# Ancillaries

- XRD:
  - Numerous temperature stages
    - P-XRD: -160°C to 1500°C, 0-20bar gas pressure (1000°C)
    - S-Xtal: 80-500K
    - Thin film: RT-1100°C in vacuum or gas
  - XYZ stages
    - Euler cradle on thin film instrument
  - Point optics
  - In-situ batteries (Li-ion etc)
  - Sample stages and holders for every occasion
    - µg of powder to lumps of steel, air sensitive samples
- SAXS:
  - Transmission, capillary- and stopped- flow systems
- Tomograph:
  - 50Kg sample capacity
  - Multiple wavelength sources

# Who's using RECX?

- NTNU Powder diffraction lab
  - ~80 local users (Students, PhD's, Postdocs etc)
  - 9 SINTEF users
  - 4 industrial (1 trained to equipment)
  - 1 External academic (Høgskolen i Nesna)
- NTNU Physics
  - Local and SINTEF users
  - 3+ industrial
  - 3+ external academic
- UiO
  - ~130 local users
  - 5 Industrial users for Powder & Thin film
  - 2 external academic users
  - 4 external SAXS and 2 external thin film users trained

# How to access RECX

- We have a website
  - www.recx.no
- Contact us and we go from there
  - Determine / design experiment
  - Choose node and instrumentation
  - On-site or "postal" access

# To Summarise

*We just spent buckets of money, and now we (and you) can do almost anything you can think of…*

*….except XRF ☺*