MYFAB – AN OVERVIEW
FOR
THE SPANISH NANOLITO NETWORK

Zaragoza, May 26, 2009
Thomas Swahn, Director Myfab
OUTLINE

- Overview, history, and networking benefits
- 2:nd phase: new goals and a new organization
- Agreements on shared responsibility
- Projects and achievements
- Exploitation
- Future: financing, expanding networks
MYFAB VISION

Myfab provides world-class micro- and nano infrastructure enabling researchers and innovators to solve the grand challenges of the future.
MYFAB MISSION

Myfab takes responsibility for quality, flexibility and uniformity in the field of micro- and nanofabrication, enabling one-stop-shop access to Sweden’s most advanced cleanrooms and complementing facilities to provide state-of-the-art resources, mutual support and rewarding synergies for researchers, innovators and entrepreneurs world-wide.
CORE VALUES

Sharing
We share common resources, knowledge and opportunities. We pass new knowledge on to others for continuous improvements.

Supporting
We have an open and generous environment supporting each other for constant enhancement of our results.

Responsibility for quality
In everything we do, we take individual responsibility and action for quality.
THE UNDERPINNING MESSAGE

- Nanotechnology is everywhere
- Nanotechnology is necessary for future applications
- Anyone can have access to clean room facilities
- Cooperation is the way to reach excellence
What is Myfab?
MYFAB PROVIDES

- One distributed cleanroom facility
- One-stop-shop to all processing needs
- LIMS – a joint system for booking, logging, resource planning and evaluation
NUMBERS AND FACTS

- 4,500 m² clean room space
- Highly trained personnel
- >500 instruments
- >$500 M investment
- >600 researchers
- >130 companies
NUMBERS AND FACTS

• 100 MSEK Myfab budget 2004 – 2009, from VR, VINNOVA, KAW and SSF
• Main financing through the universities
History
Three Swedish cleanroom facilities but no coordination:

1987 KTH, Electrum Laboratory
1997 UU, Ångström Microstructure Laboratory
2000 Chalmers, MC2 Nanofabrication Laboratory
MYFAB PROGRESS GRAPH

- National Coordination - Myfab
- Common research labs at universities
- Separate "research groups labs"
- International Facility
- National Facility Open Access
Benefits of coordination, networking and open access
BENEFITS

• Avoiding duplication of expensive equipment
• Local access to the whole network
• Harmonized user fees and instrument classes
• Backup for standard processes
• Cross-disciplinary synergies
• Access to a broad range of expertise
Myfab’s second period of operation – challenging new goals and a new organisation

October 2007 – June 2009
GOALS 2007-2009

• 20% increase of traditional academic users
• 100% increase of academic users in ”new” areas
• 100% increase of industrial users
• 50% increase of process service for European customers (including co-processing in EU-projects)
MYFAB BOARD OF DIRECTORS

Chairman: Ingemar Lundström
Ingela Agrell, SSF
Maria Janiec, VINNOVA
Karl-Fredrik Berggren, VR
Jan S Nilsson, KAW

Johan Holmberg, Secretary, VR
Thomas Swahn, Director Myfab
MYFAB MANAGEMENT BOARD

Director: Thomas Swahn

Deans of Myfab Laboratories = “Lab. Owners”:
Mikael Östling       Dag Winkler       Jan-Åke Schweitz

Lab. Mgr Nils Nordell, KTH Electrum Lab
Lab. Mgr Peter Modh, Chalmers MC2 Nanofabrication Lab
Lab. Mgr Stefan Nygren, Ångström Microstructure Lab
MYFAB OPERATIONS

• Board Meeting
• Management Board Meetings
• Operations Meetings
• Project Meetings
• Workshops
Myfab
a National Resource

“Give and take – for a larger cake!”
AGREEMENT ON SHARED RESPONSIBILITY

- A Management board representative from each Myfab labs
- Local support – formal and active
- Acting as Myfab, providing open Myfab access
- Active Collaboration
- Common Support Systems
- Common SME programs
- Common investment strategy for profile equipment
BUDGET MODEL

- **Y**: For Myfab projects, to reach Myfab goals
- **S**: For Myfab tools and processes: LIMS, Web Portal etc.
- **X**: Base support for operation of the Myfab labs
IMPACT OF THE NETWORK

• Myfab is mentioned and referred to in the Swedish ”FO-prop” as a national resource of strategic importance.

• For three* out of twenty prioritized research areas, Myfab is pointed out to be of strategic importance

* Material Science, Nanoscience, and ICT (Information and Communication Technology)
Myfab projects and achievements
SOME NETWORK ACTIVITIES (1)

• >18 projects/activities, including:

Strategic:

• Application and investment coordination: KAW, VR, VINNOVA, EU,

• Strategic planning at Vice-Chancellor level (long-term research infrastructure support)
SOME NETWORK ACTIVITIES (2)

Open Access, inter-network usage:

• Introduction course, for local- and network resources

• LIMS development, implementations, support, development:
  – our booking tool, for planning how to carry out the work, and for follow-up on usage, billing, etc.

• Myfab Web Portal – on-going
  – flexible, easy to update etc, for news, links, discussions, news, announcements etc.
LIMS
Laboratory Information Management System

A tool in itself, in full operation since 2008:
• Lists all tools and presents information
• **Booking**: User login for booking of tools
• **Planning**: Info on instrument status, tool responsible, support, planned down-time etc.
• **Follow-up**: statistics for evaluation and billing
• A uniform web-based system for all Myfab labs
• High quality standards (uptime, reliability, …)
LIMS STATISTICS

Active users from
Industry =
Institutes +
Companies

Total Universities, active users

Users

Hours
MYFAB WEB PORTAL

A web-based, flexible, information exchange and meeting forum system:

• Announcements
• Discussion groups
• Presentations
• Dynamic sections
• User interactions

Scheduled to open before summer
SOME NETWORK ACTIVITIES (3)

- Communication
- Myfab User Meeting
- Quality Platform
QUALITY PROJECT STARTED

Objectives

• Define common quality documentation
• Develop a quality platform for Myfab
• Develop a structure for handling quality documents
• Inform about different quality methods, especially for continuous improvements
• Information about ISO 9001 quality standard, and possible Myfab implementation
• Enhance information exchange within Myfab
QUALITY PROJECT

• A review of LIMS is on-going
• Discussions with the Myfab laboratories about their needs have been done (visit at MC2 and Ångström)
• Discussions how to use the portal for document handling and internal info channels have started
SOME NETWORK ACTIVITIES (4)

Continuous investments in state-of-the-art equipment

• Grant from Knut and Alice Wallenberg Foundation made investments possible!
Knut and Alice Wallenberg Foundation: 74.5 MSEK grant 2008

- The Myfab network invests in profile equipment!

25% invested and delivered, 75% on-going investments
CONTINUOUS INVESTMENTS

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25% invested and delivered, 75% on-going investments
EXPLOITATION

• More than 130 companies have been using Myfab during the last five years!

• 30 Spin-off companies have started from the Myfab laboratories

• SME Myfab Access – planned VINNOVA program
EUROPEAN NETWORKING

• All three Myfab Labs are members of SiNano Institute

• 7:th Frame Program application ”Flexible Research Infrastructures”, application 2008 + new application 2009 planned

• Extensive involvement by Myfab Labs in several European projects
MC2ACCESS

- Started 1st of January 2006
- Access offered to research groups in EU member states and associated states including the candidate countries
- Access offered to SME:s for their first access
- An access is maximum three months
- Project duration: 48 months
- Total budget: 1.6 M€
- Grant covers access, travel, and accommodation costs

www.mc2.chalmers.se/mc2access
• 48 projects has been granted so far.
• 25 projects are finished. Around 20 projects are ongoing.
• Access so far offered to 5 SMEs
• Visits are typically of 3-5 weeks length and for 1 or 2 researchers.
• Application are granted only after evaluation from a Scientific Panel, and we offer four application rounds per year.
Myfabs Future
Myfab – awaiting strategic funding decisions!

We are waiting for decisions for continued support to Myfab, to secure long-term stability and continuous improvements of our national resource.
Strengthening the National Resource
Association of additional Swedish laboratories is discussed
We already have the written support from five vice-chancellors:
Uppsala, Stockholm, Linköping, Göteborg and Lund
LUND – NANO LAB, (2007)

III-V nanowires, nano-characterization, prototyping:

- Clean room area: 150 m² (ISO 5) + 110 m² (ISO 7)
- Number of tools: 82, > 50 MSEK instrument value
- Booked eq.: ~30 000 h (‘08) (univ./ind. c:a 50/50)
- Lab users, total: 123 (univ. 82, ind. 41), active: 109
- Number of companies with own personal: 9 (active 7)
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LUND – NANO LAB

Main areas of activity:
• Epitaxial growth and processing of III-V nanowires
• High-resolution characterization of nanostructures
• Development of prototype devices (companies)

Main equipment:
• MOVPE systems for nanowire growth
• Electron beam and nanoimprint lithography
• Focused ion beam, reactive ion etching
• Evaporation, sputtering, atomic layer deposition, oxidation
• SEMs, AFMs, XRD and other characterisation equipment
LINKÖPING – NORRKÖPING

A node with three smaller cleanrooms is being discussed – “Soft Electronics Laboratory”:

- Soft- and Conventional Lithography in Linköping
  225 m², class 1000 / 100 in lithography room
- Printed Electronics in Norrköping (400 m²):
  17 tools, 90 MSEK instrument value,
  40 / 17 users from univ / ind.
Myfab
The Swedish Micro and Nanofabrication Network

Supported by:

• Swedish Research Council (Vetenskapsrådet)
• Swedish Agency for Innovation Systems (VINNOVA)
• Knut & Alice Wallenberg Foundation
• Swedish Foundation for Strategic Research (SSF)