MYFAB SUMMARY

Myfab is the Swedish national research infrastructure for cleanroom-based microtechnology, nanoscience, and characterisation, funded by the Swedish Research Council, and the three participating universities\(^1\). Myfab is an integrated open-access infrastructure serving 630 active users and about 80 companies on an annual basis\(^2\).

**Vision**

Myfab is the first choice, world-class infrastructure for micro- and nanoscale fabrication and characterization, enabling researchers and innovators to solve the grand challenges of the future.

**Mission**

Myfab provides cleanroom-based resources for microtechnology and nanoscience, supporting researchers and innovators in achieving world-class results and developing products for the needs of society.

Myfab’s ambition is to offer the best available tools and support to its users in a timely manner. Since nanoscience and nanotechnology is one of the most important fields for research and development, and since the field develops very rapidly, it is of the utmost importance for the competitiveness of Swedish researchers and innovators that the development of Myfab continues.

---

\(^1\) The three universities are Chalmers University of Technology in Gothenburg, KTH Royal Institute of Technology in Stockholm and Uppsala University. The university and external funding consists of base support from the universities and academic and external user fees.

\(^2\) From Myfab LIMS data for year 2012. Active users are users who perform activities themselves within the cleanrooms. Such users are typically part of user groups in the near environment of Myfab: in measurement laboratories or in companies, continuing the work by performing analyses, integration tasks etc.
Common values

1. **Sharing**
   We share common resources, knowledge and opportunities. We pass our knowledge on to others to enable continuous improvement.

2. **Supporting**
   We have an open and generous environment with a framework for supporting each other to constantly enhance our results.

3. **Taking responsibility**
   We take individual responsibility for everything we do and we act for quality.

Mid-term evaluation 2012

Myfab was appointed to a national research infrastructure in 2010, funded by the Swedish Research Council (SRC), the participating universities and through user fees. The current financing period 2010 - 2014 is Myfab's third, and a mid-term evaluation of Myfab and ten other national research infrastructures was carried out during September 2012, commissioned by SRC.

The evaluation report released shortly before Christmas 2012 was very favourable for Myfab. Below are three citations made by the international scientific panel in the report, which clearly communicates that Myfab has evolved into a leading research infrastructure:

> “MyFab has positioned itself as a European and world leader in micro/nanotechnologies, not only in scientific output, but also with regards to facility management.”

> “The panel feels that the management arrangement at MyFab is very good, with a very capable and enthusiastic director at its helm. All important boards and committees are in place and functioning acceptably.”

> “MyFab can serve as a model to other distributed infrastructures for micro/nanofabrication throughout Europe and as an example of a well-managed, national infrastructure for Sweden.”

Myfab – the focal point of the nation’s efforts

Being Sweden's national research infrastructure for microtechnology and nanoscience, Myfab attracts the vast majority of Sweden’s nanotechnology researchers and entrepreneurs within its field, and in 2012 we recorded an all-time-high usage for the fifth year in a row. Compared to the annual usage figures from 2008, the number of active users has increased from 493 to 630 (+27.7 %), and the number of booked tool-hours from 113149 to 137191 (+21.2 %).

Today, Myfab combines the resources and competences of three of the four large cleanroom-based nanotechnology laboratories in Sweden. Myfab applied to SRC for funding together with Lund Nano Lab (LNL) already in 2011 for inclusion of LNL in Myfab. Inclusion of LNL was also strongly advocated for by the evaluation panel, which stated in the evaluation report: “Expansion to Lund is an excellent opportunity and should be pursued to its fullest”. This

---

3 From the recommendation section of the evaluation report.
would, in addition to LNL’s resources and competence, open possibilities for collaboration with MAX-Lab/MAX IV and ESS, which are located close to LNL. LNL are already using Myfab LIMS, and statistics assembled in the same way as for Myfab give 146 active users during 2012, an increase from 129 (+13.2%) in 2011.
Myfab's steering group

Myfab's steering group was appointed by Chalmers University of Technology (Chalmers) for the period 2010-12-01 – 2012-12-31, and consists of eight members: Hans Hentzell, CEO Swedish ICT (chairman), Susanne Aalto (Assistant Prof. Radio Astronomy, Onsala Space Observatory, Chalmers), Gunilla Bökmark (CEO Sahlgrenska Science Park), Håkan Engqvist (Prof. Physics, Uppsala University), Ludvig Edman (Prof. Physics, Umeå University), Per-Erik Hellström (Docent Solid-State Electronics, KTH), Susanne Holmgren (Prof. Emerita Zoophysiology, University of Gothenburg), nominated by SRC, Nils Mårtensson (Prof. Physics, Uppsala University), nominated by SRC.

Steering group meetings

Myfab's steering group met four times during 2012, (numbering continues from 2011): meeting 5 in Uppsala on January 18, meeting 6 on April 26 at Onsala Space Observatory (including guided tour and presentation of this national research infrastructure), meeting 7 on September 11 in Gothenburg, and meeting 8 on November 13 in Stockholm.

Operational management

Myfab's operation is managed by the Director Thomas Swahn in collaboration with the communication manager Christina Caesar, and the laboratory managers Peter Modh
(Chalmers), Stefan Nygren (Uppsala University) and Nils Nordell (KTH). Project managers and representatives from Myfab’s owner group participate in some meetings, projects and workshops.

**Myfab’s International Science and Technology Advisory Board**

Myfab’s International Science and Technology Advisory Board (ISTAB) was formed after a decision at Myfab’s steering group meeting 7 and consists of three members: Prof. William Stanchina (University of Pittsburgh, PA, USA), Prof. Alain Cappy (IEMN, University Lille1/RENATEC, France), Dr. Berit Sundby Avset (SINTEF, Norway).

**Workshops for strategic planning**

Myfab annually arranges 2 -3 workshops for strategic planning, usually with a specific topic in focus. Two such workshops have been held during 2012, one in April and one in October.

**Myfab workshop 25 April 2012 in Gothenburg**

Myfab’s operations management carried out a one-day workshop in Gothenburg on April 25. The focus was on communication and preparation for the evaluation of Myfab.

**Myfab workshop 29 – 30 October 2012 in Järfälla**

Myfab’s second workshop focused on Myfab’s payment model, organisational improvements, the Myfab’s User Meeting 2013 in collaboration with NorFab, and general updates within the organization. The meeting was held at Görväln in Järfälla on 29 – 30 October, and the participants were Myfab’s Operations Management, Owner Group, and NorFab’s Management (through telephone link during part of the meeting).

**APPLICATIONS TO STRENGTHEN MYFAB**

Myfab has an operations grant from the Swedish Research Council, and together with user fees and support from the participating universities, this fuels the operations of Myfab. Myfab needs to renew and expand its equipment, to stay at the front edge. It is expected that the host universities cover investments in those tools which are considered fundamental for the cleanroom laboratories. Investments in expensive tools cannot be financed by the SRC operations grant, so Myfab therefore applies regularly for additional funding for this purpose. Such applications are based on Myfab’s strategic investment plan.

**Inclusion of Lund Nano Lab, now recommended by the evaluation panel**

Today, Myfab combines the resources and competences of three of the four large cleanroom-based nanotechnology laboratories in Sweden. Myfab applied to SRC for funding together with Lund Nano Lab (LNL) already in 2011 for inclusion of LNL in Myfab. This would, in addition to LNL’s resources and competence, open possibilities for collaboration with MAX-Lab/MAX IV and ESS, which are located close to LNL. The application was put on hold by SRC.

7
Funding for high-resolution electron beam lithography equipment granted by KAW

On 5 April 2012, Knut and Alice Wallenberg Foundation (KAW) awarded Chalmers a grant of 22 MSEK for investment in electron beam lithographic equipment at the Myfab Nanofabrication Laboratory (NFL) at MC2, Chalmers. This investment will strengthen the expert profile in high-resolution electron beam lithography at NFL.

Application to SRC in April 2012 rejected
Myfab submitted an application to the Swedish Research Council during April 2012, for investment in some strategic tools for Myfab: CVD for Graphene and an XRD, a chemical polishing tool and an ion beam etch tool. Unfortunately, the application was rejected.

MAJOR EVENTS DURING 2012

Myfab positively evaluated
Together with ten other national infrastructures, Myfab was evaluated by three international expert panels, commissioned by the Swedish Research Council.

The overall aim was to evaluate the outcome and performance of each infrastructure in relation to the intentions in the call for funding and the agreed terms and conditions specific to that infrastructure. The outcome of the evaluation will be a basis for the Swedish Research Council’s decision on further funding and measures for improvement of the infrastructures. Further, the evaluation should provide recommendations for improvement on management and activities at the infrastructures.

The outcome of the evaluation report was very positive for Myfab. We refer to the full report from the Swedish Research Council.

The members of the evaluation panel of Myfab, MAX-lab, PRACE and SuperAdam were: Odd Ivar Eriksen, the Research Council of Norway, Norway (Chair), Aaron Stein, Brookhaven National Laboratory, U.S.A., Doris Keitel-Schultz, DKSST Consulting, Germany, and Cherri Pancake, Oregon State University, U.S.A.
The evaluation comprised a self-evaluation, a user inquiry, and a hearing (18 September) held by the evaluation panel. Myfab’s representatives at the hearing were Hans Hentzell (chairman of the Steering Committee), Dag Winkler (Host University and Owner Group representative), and Thomas Swahn, Director Myfab.

VR RFI-2 visited Myfab at Chalmers on 13 March 2012

Five representatives (out of nine) of the Swedish Research Council’s Evaluation Panel 2 (BG2): Infrastructure for molecular, cell and materials science, participated in a visit to Chalmers MC2 and the Nanofabrication laboratory: Stacey Sörensen, (Lund University, chairman), Dick Heinegård (Lund University, vice chairman), Tor Ny (Umeå University), Xiaodong Zou, (Stockholm University), and Lars Wärngård (VINNOVA). Tove Andersson and Johan Holmberg from the Research Council took part. Additional members of BG2: Björgvin Hjörvarsson (Uppsala University), Kajsa Uvdal (Linköping University), Ingrid Reineck, Sandvik and John Eriksson (Biocenter, Turku, Finland).

KTH ISO 9001 audit as a basis for Myfab's quality control work

Det Norske Veritas (DNV) carried out an audit for certification of Electrum Laboratory according to the ISO9001:2008 standard in April 2012. The results of this audit form the basis for broader quality control work in Myfab. A work group is being created, where personnel from the three Myfab laboratories carry out a project to define a suitable scope for a quality system for Myfab and then implement the same.

Myfab's annual report for 2011 delivered to the Swedish Research Council

On 15 April, Myfab delivered its annual report to SRC.

The International Science Festival in Gothenburg 2012

The Nanofabrication Laboratory and MC2 as usual hosted the very popular 'Nanoscientist for
a day' during the Science Festival. During the activity, one class of 11 year old schoolchildren visits the cleanroom each day for some hands on experiments.

**Future Friday**

The tour of the Electrum Laboratory was a highly appreciated item at the annual Future Friday event at KTH School of ICT. Future Friday is intended primarily for students in grades two and three in high school and inspires to future studies within the field of information and communication technology. [http://www.futurefriday.se/](http://www.futurefriday.se/)

**Myfab LIMS User Meeting**

On November 20, the first Myfab LIMS User Meeting at Chalmers assembled about 15 representatives from cleanrooms using Myfab LIMS to discuss status and plan which new functionality we want to develop for the benefit of everyone.

**COMMUNICATION**

The overall communication strategy is to strengthen the image of Myfab as an open, flexible, world-leading and reliable infrastructure for micro and nanofabrication. This will position Myfab as the first choice for nanofabrication in Sweden.

Myfab’s most prioritized target group is researchers at all levels within the academic system, but also at high-tech companies, mainly start-ups, and companies that perform research.

Over the course of 2013, Myfab will become increasingly visible to a broader target group, especially toward new users in small and medium-sized companies and within academia, to funding agencies and the general public. To attract new users and small and mid-sized companies, the Myfab Access program (see below) was initiated. The program will lower the start-up financial barrier and stimulate the creation of new activities and relations.

During 2012, a draft for an extensive *Myfab brochure*, “This is Myfab”, was produced. The brochure will be finalized during 2013. The brochure will be used to inform and attract new users as well as the public. The brochure aims to increase the understanding of nanotechnology and what nanotech can achieve in product development and growth opportunities for small and medium-sized companies. Success stories have been identified that originate from Myfab-related research and they will increase the understanding and possibilities of nanotechnology.

During 2012, Myfab continued with inviting researchers from universities around the country to visit our laboratories and gaining an understanding of what resources are available for them to use in Myfab.

*Myfab LIMS* – our common electronic interface - promotes use of the infrastructure with its open access and presentation of all resources.

The *Myfab User Meetings* (bi-annual) have become the largest national meeting place for nano-researchers. In 2013, the user meeting will be widened even more, and contacts to
interact with other organisations within the nano research community, such as SwedNanoTech and NorFab (Norwegian equivalent to Myfab) have been established.

MYFAB ACCESS

Based on a decision at Myfab’s 6th steering group meeting, 1.5 MSEK was allocated to a program of first-time free access for new users – Myfab Access. Myfab Access offers free access to the cleanroom facilities for a limited test or start-up project. The aim is to make potential new users aware of the resources available through Myfab, and the major opportunities that exist for companies to get assistance in developing innovations in their respective areas of operation.

The program was announced on 6 November with a first call for proposals, and a program selection panel with members from all of the three Myfab laboratories/universities will distribute the funding based on project quality and guidelines prioritising users from academia and SMEs who are expected to be returning users. The program manager for Myfab Access is Ulf Södervall, Chalmers (former project manager for FP6 MC2 Access), and the program selection panel consists of Niclas Roxhed (KTH), Nils Nordell (KTH), Greger Thornell (ÄSTC & chairman for MSL steering group), Stefan Nygren (UU), Göran Alestig (Chalmers) and Jan Stake (Chalmers).

OUTREACH ACTIVITIES

Several outreach activities were carried out by Myfab’s operational management during 2012; below are some of the most important.

Electrum Laboratory board meeting 20 February
Myfabs Director presented Myfab’s vision and strategy at the board meeting of the Electrum Laboratory in Kista on 20 February.

NorFab collaboration - Trondheim visit 20 – 22 May
Myfab’s operations management visited NorFab at NTNU to see their facility and discuss collaborations. During the meeting, Myfab and NorFab decided to co-arrange a user meeting during spring 2013.

**Oslo 25 May – Myfab LIMS for NorFab**

Peter Modh and Martin Klarkvist (Intiro) visited NorFab at the University of Oslo to support the setup of the Myfab LIMS environment for NorFab.

**Workshop: “Research Infrastructure for Industrial Innovations”, 14 June Stockholm**

The Director presented Myfab at a national workshop (translated), “Research Infrastructure for Industrial Innovations”, arranged by the Swedish Research Council, VINNOVA, Industrirådet, and RISE. The title of the presentation was (translated) “Myfab – an environment where research and industry meet”. The workshop also included several discussion sessions in groups, with the aim being to find general conclusions and discuss best practices. The participants (around 60) typically represented decision makers from industry and research founders. Relative to other research infrastructures presented at the workshop, Myfab can offer very short access time or even instant access through its open access scheme. Currently, about 1 in 5 users come from industry, and about 80 companies use Myfab annually.

**Toulouse 25 – 26 October – TRAIN² workshop**

The Director Thomas Swahn was invited to present Myfab at the TRAIN² workshop in Toulouse on 25 – 26 October. The focus was on infrastructure networking, and the meeting had participants from around ten European countries. Invited presentations were also given by RENATECH from France, Tyndall Institute from Ireland, and IMTEK from Germany. Participants at the meeting decided to co-edit a white paper, formulating expected benefits from collaboration with structuring the European infrastructure landscape, and proposing calls for pan-European open access programs.

**Delft 21 November**

Myfab’s Director participated together with NorFab in a meeting with NanoLab NL at Delft University on 21 November.

**Southampton 22 November**

Peter Modh, laboratory manager at Chalmers NFL, visited the University of Southampton on 22 November, to give a demonstration of Myfab LIMS.

**Myfab exhibitions 2012**

Myfab set up exhibitions and organized lab tours at several conferences and events during 2012; some examples:

ATTEMPTS TO STRUCTURE NATIONAL EUROPEAN INFRASTRUCTURES

Recently, several discussions and activities have started with the aim of coordinating national nanotechnology research infrastructures within Europe. The idea, promoted by Myfab several times since an initial meeting in Paris in July 2009, is that through coordination, open access and suitable funding, pan-European collaboration and cross-fertilisation will emerge in a similar way but on a larger scale as compared with the concluded FP6 MC2 Access. During almost all of the visits and presentations described in the previous section, benefits of taking an initiative to structure European infrastructures were discussed.

FP7 NANO-TECH Ecosystem Technology

In the FP7 NANO-TEC project, where Myfab participates and where Chalmers is responsible for arranging four workshops, it was decided that Myfab's Director and the Director of RENATECH (France) Alain Cappy should present the conclusions from the “Ecosystem” part of the project to representatives of the Capacities program. This is yet another proposal for structuring the European research infrastructures. In essence, the project recommends that each country is represented by its national research infrastructure (i.e. the project recommends countries to form such national research infrastructure networks if they do not already exist), and that Europe should not create a new organisation for this purpose, but rather this should be taken care of by one of the existing organisations.

QNANO

Myfab, represented by Uppsala University, participates in this European Union-funded infrastructure for nanomaterial safety testing. The four year project began in February 2011 and comprises 27 top European experimental and analytical facilities in nanotechnology, medicine and natural sciences. It aims to create an integrated hub to support Europe’s nanosafety research community. Myfab-Ångström participates in joint research activities and provides transnational access to the lab resources.
European Commission consultation on research infrastructures

The European Commission invited to an open consultation on Research Infrastructures, topics for Integrating Activities, which was open 15 July – 22 October 2012. The aim is to provide a wider and more efficient access to, and use of, the research infrastructures existing in EU Member States, Associated Countries, and at international level when appropriate.

Myfab has submitted a proposal, which was coordinated with several other European national research infrastructures. For instance, in Norway NorFab submitted a proposal which focused on an identical approach, and partners in the TRAIN²-project (including partners from RENATEC France and NANOLITO Spain) also submitted a proposal that was coordinated with Myfab’s.

In the context of structuring European research infrastructures, Myfab LIMS was proposed by Myfab as an efficient tool, already used by four national research infrastructures, to operate and create reports from open research infrastructures.

The commission reported in December 2012 that it has received more than 550 proposals representing more than 250 topics. No individual feedback will be given, but a final report by high-level experts will be made available by the end of February 2013.

MYFAB LIMS

The Norwegian equivalent to Myfab, NorFab, has been running Myfab LIMS since 1 July in its three university cleanrooms:
- NTNU NANO LAB at NTNU Trondheim,
- UiO MinaLab at University of Oslo
- HIVE MST-LAB at Vestfold University College
- 

The fourth node at SINTEF in Oslo is operated in a different way, and Myfab LIMS needs some further development to include batch follower and queue systems before the SINTEF node can start using LIMS.

KTH Royal Institute of Technology has set up a Materials Laboratory, a virtual environment based on Myfab LIMS and a web portal based on the same platform as Myfab’s. Here researchers can search and get information about all equipment in Electrum Lab, Greenhouse Labs and KTH Materials Lab.
SPECIFIC POINTS REQUESTED BY SRC IN THE ANNUAL REPORT

In the contract between the Swedish Research Council and Myfab, it is stated that Myfab should address the ten points listed below in the annual report.

1. Number of users, including new groups

Myfab introduced its in-house developed Myfab LIMS system by 1 January 2008 in all Myfab laboratories, and we passed our first 5-year milestone by the end of 2012.

Statistics from Myfab LIMS display 1094 users with access during 2012, 630 of which are active, i.e. have been using the infrastructure at least once during 2012. This is the highest number registered up to now. The corresponding numbers for 2011 are: 1040 total number/622 active users, in 2010 we registered 982 users/573 active users, in 2009 we had: 906 users in total/524 active users, and finally during 2008: 841 registered users/493 active users. The relative change since 2008 is that in 2012 the total number of users has increased by 253 or 30.0 %, and the corresponding increase for active users is +137 and +27.8 %.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Users</th>
<th>Change Relative to Previous Year [Number / %]</th>
<th>Accumulated Change [Number / %]</th>
<th>Active Users</th>
<th>Change Relative to Previous Year [Number / %]</th>
<th>Accumulated Change [Number / %]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>1094</td>
<td>+54 / +5.2 %</td>
<td>+253 / +30 %</td>
<td>630</td>
<td>+8 / +1.3 %</td>
<td>+137 / +27.8 %</td>
</tr>
<tr>
<td>2011</td>
<td>1040</td>
<td>+58 / +5.9 %</td>
<td>+199 / +23.7 %</td>
<td>622</td>
<td>+49 / +8.6 %</td>
<td>+129 / +26.2 %</td>
</tr>
<tr>
<td>2010</td>
<td>982</td>
<td>+76 / +8.4 %</td>
<td>+141 / +16.8 %</td>
<td>573</td>
<td>+49 / +9.4 %</td>
<td>+80 / +16.3 %</td>
</tr>
<tr>
<td>2009</td>
<td>906</td>
<td>+65 / +7.7 %</td>
<td>+65 / 7.7 %</td>
<td>524</td>
<td>+31 / +6.3 %</td>
<td>+31 / +6.3 %</td>
</tr>
<tr>
<td>2008</td>
<td>841</td>
<td>No data available</td>
<td></td>
<td>493</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note Myfab LIMS has been used at all Myfab laboratories since 2007. Data from 2007 and earlier were not registered fully or registered using other methods, and are not suitable for comparison.

If Myfab and Lund University receive a positive decision on our application from 2011 for the inclusion of Lund Nano Lab (LNL), an additional 146 active users at LNL (an increase from 129 or +13.2 % as compared with 2011) would result in a total of 776 active users. LNL is already using Myfab LIMS, a corresponding prising model so their statistics could be compared on equal terms with that of Myfab.

In Uppsala a new group from the biomedical disciplines and five small companies added new users during the year, whereas another recent start-up left the lab due to bankruptcy. ÅAC Microtec, a long-term multiple-user company, entered a rental agreement to install their own tools and processes. At Chalmers, two new academic user groups and one start-up company, all three from biomedical disciplines, started to use the cleanroom infrastructure. In Stockholm three new companies and six research groups (from KTH, Stockholm University and Karolinska Institute) were added to the user’s list.

*We have checked so we do not double-count users which are active users in both Myfab and NLN.*
2. **Major changes of the organisation**

Myfab has strengthened the communication organisation by assigning a communication manager: PhD Christina Caesar on 50% of a full-time position (starting at the end of August 2012).

3. **Number of peer-reviewed articles related to the infrastructure**

The number of peer-review articles by authors or projects using Myfab during 2012 is 627. The number is the result from a process where each publication is manually selected if the work reported is based on Myfab usage to a significant extent, using data lists from available databases at the participating universities, which are compulsory for the affiliated staff to keep updated. Currently, Myfab does not have a routine of its own to register publications, so the actual number of publications is likely to be higher than we report here. One outcome from the evaluation of Myfab was the recommendation to introduce a (compulsory) reporting process for Myfab users, and Myfab will evaluate the best possible implementation from both the user and the reporting perspectives during 2013.

4. **Number of patents related to the infrastructure**

Myfab has more than 600 active users who bring about project activities involving 1500 – 2000 persons or even more taking into account that each active Myfab user typically collaborates with 2 – 3 persons when outside the cleanroom laboratory. This extensive group of researchers and entrepreneurs is spread around a large number of research groups and companies. It is not mandatory for Myfab users to report patents emerging from the infrastructure, and neither is there a process through which patents or other IP rights are gathered. The reason for this is that Myfab does not track nor control the use of results among its users. The number of patents is therefore difficult to determine, and we are not prepared to answer the question in any other way than this. From a manual investigation some data is available: KTH reports three patents and six patent applications during 2012, and Chalmers reports three patent applications.

5. **Economical account including other major contributions applied for or received**

The total operations grant during 2012 from SRC was 31 000 000 SEK. Most of the funding was distributed to the three Myfab laboratories according to the established key number (so called X-funding): Chalmers 40%, KTH 30% and UU 30%. The corresponding amounts are: 9 164 000 SEK, 6 873 000 SEK and 6 873 000 SEK, total: 22 910 000 SEK. 1 500 000 SEK was distributed to the further development of the Myfab LIMS and Myfab’s website, 2 990 000 SEK was distributed to Myfab’s administrative account, 1 600 000 SEK to the Myfab Access project (100 000 SEK thereof for project management), and finally 2 000 000 SEK was equally distributed among the three laboratories to strengthen their organisations to better assist new users and users from new fields. These contributions (666 667 SEK per lab) were transferred to the 2013 budget since the recruiting process could not start during the few remaining weeks of 2012.

The sum of administrative costs 2012 is 3 277 974 SEK which includes remuneration to the steering board, salaries to the director and communication officer, consultant costs, advertising, information, printing costs, travel expenses, rent for premises etc. The balance of
Myfab’s administrative account is positive, but decreased to 2 536 170 SEK by 31 December 2012 (2 824 144 SEK 2011-12-31).

The LIMS account has a negative balance: -202 226 SEK (187 977 SEK 2011-12-31); the reason for the negative balance is that the invoicing process of licence costs (from Norway, Finland and Ireland) was delayed. The amount corresponds to the negative balance and will be reported as an income to the LIMS account during 2013.

Below we present separately the budgets for Myfab’s laboratories:

Chalmers Nanofabrication laboratory, 2012

<table>
<thead>
<tr>
<th>Income</th>
<th>SEK</th>
<th>Costs</th>
<th>SEK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty grants</td>
<td>20 589 200</td>
<td>Personnel</td>
<td>15 796 326</td>
</tr>
<tr>
<td>Chalmers foundation</td>
<td>6 000 000</td>
<td>Rent premises</td>
<td>18 269 166</td>
</tr>
<tr>
<td>Myfab</td>
<td>9 930 666</td>
<td>Depreciation</td>
<td>7 905 129</td>
</tr>
<tr>
<td>External customers</td>
<td>4 003 055</td>
<td>Equipment and service</td>
<td>5 204 450</td>
</tr>
<tr>
<td>User fees Chalmers</td>
<td>2 225 537</td>
<td>Consumption</td>
<td>5 730 180</td>
</tr>
<tr>
<td>User fees MC2</td>
<td>14 712 170</td>
<td>Overhead</td>
<td>4 555 377</td>
</tr>
<tr>
<td>Finances depreci.</td>
<td>17 000 000</td>
<td>Finances depreci.</td>
<td>17 000 000</td>
</tr>
<tr>
<td>Income, total</td>
<td><strong>74 460 628</strong></td>
<td>Costs, total</td>
<td><strong>74 460 628</strong></td>
</tr>
</tbody>
</table>

KTH Electrum Laboratory, 2012:

<table>
<thead>
<tr>
<th>Income</th>
<th>SEK</th>
<th>Costs</th>
<th>SEK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty grants</td>
<td>13 200 000</td>
<td>Personnel</td>
<td>15 700 000</td>
</tr>
<tr>
<td>User fees, University</td>
<td>18 600 000</td>
<td>Rent premises</td>
<td>11 700 000</td>
</tr>
<tr>
<td>U. fees comp. incl. Acreo</td>
<td>16 200 000</td>
<td>Operation</td>
<td>18 800 000</td>
</tr>
<tr>
<td>Myfab</td>
<td>7 539 667</td>
<td>Overhead</td>
<td>3 973 000</td>
</tr>
<tr>
<td>Services etc.</td>
<td>1 500 000</td>
<td>KAW depreciation</td>
<td>4 400 000</td>
</tr>
<tr>
<td>KAW grants</td>
<td>4 400 000</td>
<td>Depreciation</td>
<td>6 200 000</td>
</tr>
<tr>
<td>To 2013-budget</td>
<td>-666 667</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income, total</td>
<td><strong>60 773 000</strong></td>
<td>Costs, total</td>
<td><strong>60 773 000</strong></td>
</tr>
</tbody>
</table>

Uppsala Ångström Microstructure Laboratory\(^5\), 2012:

<table>
<thead>
<tr>
<th>Income</th>
<th>SEK</th>
<th>Costs</th>
<th>SEK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty grants</td>
<td>12 043 000</td>
<td>Personnel</td>
<td>8 433 000</td>
</tr>
<tr>
<td>Myfab</td>
<td>7 539 667</td>
<td>Rent premises</td>
<td>11 458 000</td>
</tr>
<tr>
<td>User fees, remun.</td>
<td>10 521 000</td>
<td>Operation</td>
<td>6 440 000</td>
</tr>
<tr>
<td>KAW grants</td>
<td>3 665 000</td>
<td>Overhead</td>
<td>2 774 000</td>
</tr>
<tr>
<td>To 2013-budget</td>
<td>-666 667</td>
<td>Depreciation</td>
<td>4 165 000</td>
</tr>
<tr>
<td>Income, total</td>
<td><strong>33 102 000</strong></td>
<td>Costs, total</td>
<td><strong>33 270 000</strong></td>
</tr>
</tbody>
</table>

\(^5\) In the compilation for Ångström Microstructure Laboratory, the budget for Ion Technology Center (ITC) is not included.
The Myfab Access account holds 1,600,000 SEK because the projects had not yet started their activities by the end of 2012. The Myfab Access funding will finally be distributed to the Myfab laboratories to cover processing costs and project management. The total turnover of the three Myfab laboratories was 168,335,628 SEK, in which 25,010,000 SEK from Myfab’s operations grant (of a total of 31,000,000 SEK) is included. Myfab’s operation grant is 18.4% of the laboratories’ total revenues, and its contribution directly to laboratory operation is 14.9%.

6. International contacts and collaborations

National collaboration on the Myfab level is particularly strong with Lund Nano Lab (LNL). For more than three years, LNL has been operating in a way very similar to Myfab, e.g. by using Myfab LIMS for tool booking. Also, other Swedish and European laboratories use Myfab LIMS in their operation.

Myfab is a founding member of SwedNanoTech, the umbrella organisation for Swedish nanotechnology actors with the goal of increasing the knowledge of nanotechnology in a broad sense.

In the European arena, Myfab is strengthening the bilateral collaboration with other national research infrastructure networks. The collaboration with the Norwegian NorFab is well developed, with common meetings and a suggested co-arrangement of the Myfab User Meeting in 2013. Collaborations with the French RENATEC, NanoLab NL in the Netherlands, and Spanish NANOLITO networks have been initiated and visits have been made to their sites. A focus for Myfab is to influence the call structure of the European Union, and hence Myfab is participating as the Swedish node in the “Small institutes group”, together with partners from Finland, Norway, Ireland, the Netherlands, Belgium, UK, Greece and Spain. Myfab also follows the development in the EIN2 initiative for new calls. In addition, the Myfab nodes are members in the SiNANO institute and participate in the technology platforms of Photonics 21 and ENIAC, and are also members in a number of EU funded infrastructure related projects, e.g., FP7 Nano Connect Scandinavia and NANO-TEC (Chalmers), QNano (Uppsala University) and Technet_nano (KTH). Through KTH, Myfab participates in the cleanroom platform collaborative network since 1997, where representatives from eight European laboratories meet twice annually.

7. To what extent the scientific goals have been achieved, or new revised goals

Myfab is a research infrastructure which provides access to a large number of tools for fabrication and characterisation, expertise on process flows and individual tools, as well as on a wide range of applications. Myfab does not produce scientific results itself; its mission is to support users from academia and industry to achieve their goals. Myfab’s goals are therefore managerial and technical rather than scientific.

As already mentioned above (section Major events during 2012), Myfab and 10 other national research infrastructures were evaluated (a mid-term evaluation arranged by SRC), where a large number of aspects of being a research infrastructure were evaluated. We refer to the evaluation report from SRC: “Interim Evaluation of 11 national research infrastructures – 2012 44” for a complete description, but we can conclude that Myfab so far indeed has achieved its goals and fulfils its mission. Citing the final report from the evaluation: “The panel
concludes that MyFab certainly fulfils the expectations of the grant, including the terms and conditions for research infrastructure.”, and, even more positive: “MyFab can serve as a model to other distributed infrastructures for micro/nanofabrication throughout Europe and as an example of a well-managed, national infrastructure for Sweden.”

8. Major scientific breakthroughs

The examples listed below have in all cases used Myfab facilities to some extent

**Advanced brain investigations can become better and cheaper**
An important method for brain research and diagnosis is magnetoencephalography (MEG). But the MEG systems are so expensive that not all EU countries have one today. A group of researchers at Chalmers University of Technology are now showing that MEG can be performed with technology that is significantly cheaper than that which is used today – technology that can furthermore provide new knowledge about the brain.

Communication between brain cells generates magnetic fields that can be measured with SQUID sensors. Focal MEG puts the sensors closer to the head, thereby improving signal levels and enhancing focus on brain activity
Illustration: Philip Krantz, Krantz Nanoart

**Quantum microphone captures extremely weak sound**
Scientists from Chalmers University of Technology have demonstrated a new kind of detector for sound at the level of quietness of quantum mechanics. The result offers prospects of a new class of quantum hybrid circuits that mix acoustic elements with electrical ones, and may help illuminate new phenomena of quantum physics.

**Graphene mixer can speed up future electronics**
Researchers at Chalmers University of Technology have for the first time demonstrated a novel subharmonic graphene FET mixer at microwave frequencies. The mixer provides new opportunities in future electronics, as it enables compact circuit technology, potential to reach high frequencies and integration with silicon technology.
Rapid laser for harsh environments
Researchers at Chalmers University of Technology have reached a data rate of 40 Gbit/s at a temperature of 85 °C through on-going development of their already world-leading technology for fast data communication lasers. This is a breakthrough in the quest for fast lasers for optical communication links in harsh environments such as data centres and supercomputers, where temperatures can reach high levels, while large amounts of data must be transferred between routers, servers, switches, processors and memories.

Nanoelectronics with spin
Spintronic research at Chalmers University of Technology utilises spin function of electrons in semiconductors and two-dimensional electronic materials. The researchers have shown that the electrical current and thermal gradient create large spin polarisation of silicon and spin transport in the graph, at room temperature. The purpose of this research is to integrate both memory and logic operations using the electron spin degree of freedom in a single nano-device.

Monolithic Microwave Integrated Circuit with world record performance
Scientists at Chalmers University of Technology have successfully processed InP wafers in monolithic microwave integrated circuit (MMIC) process containing among others K/Ka 3-stage amplifiers intended for cryogenically cooled extremely low noise amplifiers. The amplifiers were designed, manufactured and delivered under contract to the European Space Agency/European Space Operational Centre in Darmstadt, Germany for use in ground stations for deep space communication, e.g. ESTRACK Malargüe, Argentina. The performance of the amplifiers is on the level of world record results for these frequencies.

New transistor for millimetre-wave power applications up to 100 GHz
Chalmers’ research on devices and integrated circuits based on wide band-gap semiconductors (WBG) is targeting the need for power generation at high frequencies. We have developed fabrication and characterisation methods to evaluate such electronics for application in mobile communication infrastructure and sensor application. This year we have demonstrated an InAlN/AlN/GaN transistor, with a maximum frequency of oscillation above 200 GHz, which enables the design of circuits above 100 GHz. This transistor was fabricated in Nanofabrication Laboratory at Chalmers and has a nominal minimum line width of 50 nm.

World record in low noise amplifiers for microwave
Researchers at Chalmers University of Technology have made a new world record in low-noise performance of a microwave amplifier, as low as 0.002 dB. These amplifiers with low noise are of great interest for equipment requiring high sensitivity and gain, e.g. in physics and astronomy.

Preparation of graphene
Researchers at Chalmers University of Technology have shown a promising technique for free transferable transparent electrode production. The graphene is a scalable and uniform material, with the ability to control the thickness. It can be put on virtually any non-metallic substrates that stand out at 1000 °C makes it a material with many possibilities. Graphene deposited directly onto quartz and sapphire shows transmittance and conductivity similar to
exfoliated or metalcatalysed-graphene. The model proposed is a non-catalytic CVD mechanism in which a high methane concentration, a long deposition time, a high temperature and smooth substrate are required to grow a large area of the graphene by means of carbon/hydrogenpyrolysis.

**Space probes will be more useful with amplifiers from Chalmers**

Researchers at Chalmers University of Technology have developed a new generation of amplifiers, which the European Space Agency (ESA) will be using throughout the world to receive signals from its space probes and satellites. ESA will be able to use the new amplifiers to measure data that is currently buried by noise.

![Image of Mars Express](image_url)

The space probe Mars Express with the aim of searching for water at the surface of Mars and launch a robot on its surface. Image courtesy of ESA.

**SiC integrated circuits operating at 500 C**

Silicon carbide (SiC) has been investigated for high voltage devices over the past 20 years at KTH (spun off in TranSiC AB and later acquired by Fairchild Semiconductor). Recently, high temperature operation has been demonstrated, first at 300°C and now at 500°C. Researchers at KTH Royal Institute of Technology have developed a unique in-house process technology for bipolar mixed signal silicon carbide integrated circuits, and the first batch has been successfully tested at 500°C. The KTH research was also assessed in the RAE 2012: “The unit clearly has internationally leading expertise in the area of SiC based devices and circuits. It is arguably the strongest academic unit in the world.” Applications for high temperature electronics can be found in many areas including nuclear energy, geothermal energy, and oil and gas drilling. The project continues with SSF funding under the motto: “to boldly go where no electronics has gone before”.

**Novel Graphene Hot Electron Transistors in KTH**

Researchers at KTH Royal Institute of Technology have demonstrated the first Graphene Base Hot Electron Transistor (GBT). This novel device exploits both the ultra-thinness and high conductivity of graphene to deliver superior DC and RF performance. Unlike the conventional
graphene field effect transistors, the carriers transport perpendicular to the graphene plane showing high ON/OFF ratio. Considering the compatibility of the fabrication scheme with state-of-the-art silicon technology, GBT is promising for future RF and digital electronics.

High Performance Sensors based on Graphene Technology
Researchers at KTH Royal Institute of Technology are developing next generation sensing devices. These devices combine graphene's extraordinary electrical and mechanical properties to make high sensitivity pressure sensors. They also combine the advantages of state-of-the-art performance with a smaller size than conventional sensors.

Highly scaled thulium silicate interfacial layer for high-k/metal gate CMOS technology
Advanced CMOS technology is the enabling technology for the information and communication society. Scaling the interfacial layer between the Si channel and the high-k oxide in transistors without increasing leakage current and maintaining high mobility is key for future CMOS technologies. Researchers at KTH Royal Institute of Technology have developed a thulium silicate (TmSiO) process based on atomic layer deposition that enables an extremely scaled equivalent interfacial layer thickness less than 0.3 nm with low leakage current and high mobility.

High density silicon nanowire-based sensors
The silicon nanowire is a promising nanostructure for biochemical sensors. For future silicon nanowire-based sensors, it is mandatory to integrate a vast amount of silicon nanowires with CMOS technology. At KTH Royal Institute of Technology, a cluster tool has been upgraded to allow both reactive ion etching and plasma enhanced deposition without breaking vacuum. Using the cluster tool researchers have advanced KTH’s Sidewall Transfer Lithography process and demonstrated individually addressable nanowires with a density >10^5 cm^{-2} by the integration of nanowires into KTH’s CMOS process.

SiGeSn epitaxy for nanoelectronics and nanophotonics
The SiGeSn material system is attractive since band engineering can tailor the material properties to enhance the performance of transistors, detectors and light emitters. At KTH Royal Institute of Technology, researchers have developed a Sn source and implemented it in a chemical vapour deposition tool to enable epitaxial deposition of SiGeSn on Si wafers. High quality SiGeSn layers with high Sn content of 6 % has been demonstrated.

Artists perspective on nanotechnology
The Albanova Nanofabrication Laboratory sponsored and worked with the VR funded project "NanoFormGiving", which brings an artist’s perspective to nanotechnology. See http://www.nanoform.se

Epiclarus – a III-V spin-off
Epiclarus, a spin-off company from KTH Royal Institute of Technology, is based on more than two decades of experience from active research in III-V materials and devices. It provides epitaxial solutions for components requiring very thick layers of InP and GaAs on planar or non-planar substrates or structures, using Hydride Vapor Phase Epitaxy. Epiclarus has in less than a year established a stable customer base and estimates a turn-around at 1.5 MSEK for 2013.
Epiclarus – a III-V spin-off
Epiclarus, a spin-off company from KTH Royal Institute of Technology, is based on more than two decades of experience from active research in III-V materials and devices. It provides epitaxial solutions for components requiring very thick layers of InP and GaAs on planar or non-planar substrates or structures, using Hydride Vapor Phase Epitaxy. Epiclarus has in less than a year established a stable customer base and estimates a turn-around at 1.5 MSEK for 2013.

Intermodulation Products – an Atomic Force Microscope start-up
The Nanostructure Physics group at KTH Royal Institute of Technology has launched a start-up company, Intermodulation Products AB, which is making and marketing signal processing hardware and software for advanced surface analysis with the Atomic Force Microscope. They have recently published a breakthrough method based on this technology in the journal Nature Communications [DOI: 10.1038/ncomms2365].

World’s smallest optical disk resonator
KTH has built the world’s smallest optical disk resonator, which will be able to increase the bandwidth and significantly reduce the power consumption at large data centers used by, e.g., Google and Facebook. The resonator acts as a filter which may be used in light modulators and detectors. The breakthrough is a step towards photonics integrated circuits, with dimensions approaching transistor ditto, and will eventually replace electronic connections with more efficient optical ones.

Liquid alloy printing of microfluidic stretchable electronics
Integrated circuits of elastic electronics is set to enable exciting new form factors for electronic devices that are not possible with conventional rigid or flexible electronics. However, just as with traditional electronics, these ICs must be complemented with large-area stretchable PWBs and components. A breakthrough demonstration at the Ångström Laboratory MST program is the
microfluidic stretchable printed intelligence formed by liquid alloy structures that have been printed and embedded in elastomers with integrated electronic components.

Ultra-sensitive magnetic probes flying from the International Space Station
One of the ultra-sensitive magnetoresistive magnetometers developed by the MST program and Ångström Space Technology Centre has now been tested in a pico-satellite sent out from the International Space Station.

Miniaturized sampler allows for sub-glacial and volcanic aquifer microbial sampling
Within the MST program and Ångström Space Technology Centre research project on advanced miniaturized submersable explorers a unique miniaturized sampler has been developed. Combining acoustic trapping and high pressure valving that allows for sub-glacial and volcanic aquifer microbial sampling at high depths.

A graphene capacitor for field-effect ion sensing
The unique electronic properties of graphene were exploited for field-effect sensing in both capacitor and transistor modes when operating the sensor device in electrolyte. The device was fabricated by researchers at Uppsala University, using large-area graphene thin films prepared by means of layer-by-layer stacking. Although essentially the same device, its operation in the capacitor mode was found to yield more information than in the transistor mode. The capacitor sensor could simultaneously detect the variations of surface potential and electrical-double-layer capacitance at the graphene/electrolyte interface when altering the ion concentration. The capacitor-mode operation further facilitated studies of the molecular binding-adsorption kinetics by monitoring the capacitance transient.

Solution-processed logic gates based on nanotube/polymer composite
Researchers at the Ångström Laboratory have demonstrated hysteresis-free logic gates capable of operation at 100 kHz. The devices were based on local-gate thin-film transistors with their channel featuring solution-processed composite films of single-walled carbon nanotubes and semiconducting polymer F8T2. Using dip-coating for deposition of composite films, the circuit fabrication process was simple and robust. The fabricated transistors that constituted the basic building block for the logic gates were characterized by nil hysteresis, high carrier mobility, large on/off current ratio, low operation voltage, small subthreshold swing, and remarkable scalability.

Unique processes for contact metallization for nano-CMOS technology
Nano-scale CMOS devices have become 3-D in structure and their fabrication requires a decreasing thermal budget. By exploiting the Ångström Laboratory expertise in contact metallization using metal silicides and high-power impulse magnetron sputtering (HiPIMS) for metal deposition, we achieved conformal and stable formation of ultrathin nickel-silicide films over 3-D structures relevant to the most advanced tri-gate transistor architecture. Our unique access to the advanced microwave annealing technique allowed us to realize low-temperature nickel-germanosilicide formation on epitaxially grown SiGe layers. Because of the low-temperature processing, the nickel-silicide films formed were low-resistive and uniform in thickness, both are crucial for high-performance nanoelectronics.

Negative electron mobility in diamond
Researchers at Uppsala University have discovered negative differential electron mobility in diamond. This is the first time this phenomenon is observed in an elemental semiconductor material
and may lead to new electronic devices, such as Gunn diodes in diamond for microwave applications.

**High efficiency thin film solar cells**

During 2012, CIGS-based solar cells with 18.6 % efficiency using a CdS buffer layer and 18.2 % using a ZnSnO buffer layer have been fabricated at the Ångström Laboratory (both values externally confirmed). Several concepts for improvements have been identified, and back contacts will be in focus for the coming period. In the area of CZTS-based solar cells, using sputtering and post-annealing, efficiencies have increased from 4.7 % to 7.5% in 2012. Theoretical calculations show a way of avoiding loss of tin during CZTS processing. This has been verified experimentally.

**Aggregated proteins involved in Alzheimer's disease visualized for the first time**

Researchers at the Ångström Laboratory have in a collaboration with Uppsala University Hospital and the Swedish company BioArctic Neuroscience used AFM and Raman spectroscopy to demonstrate aggregated oligomeric states of the proteins amyloid-beta and alpha-synuclein, both strongly involved in the neurodegeneration process of the brain. Understanding these aggregation processes are believed to be essential for future development of novel drugs and therapies.

**Multidisciplinary research centre praised for making heavy use of the Myfab equipment**

Uppsala Berzelii Technology Centre for Neurodiagnostics, a 10-year initiative from VINNOVA and the Swedish Research Council, has now reached half time and was evaluated by international reviewers in 2012. These experts were in particular impressed by how the Centre has been able to connect medical doctors, biologists, engineers and physicists to jointly attack difficult questions related to neurodegeneration. They also encouraged the many projects involving staff and equipment at Myfab-Ångström, e.g. to fabricate metalized nanowires from DNA threads in an attempt to develop a supersensitive protein detection method.

**New distant galaxies to be explored with novel diamond micro-optics**

Scientists at Université de Liége in Belgium have together with researchers at the Ångström Laboratory developed a novel solution for exploring exoplanets in remote galaxies. The device, which now is being tested at the European Southern Observatory in Chile, is based on a mid-infrared achromatic half-wave plate with diamond subwavelength gratings. The diamond microfabrication was carried out using laserbeam lithography and plasma dry etching.

**A gold nano-wire based electrical sensor using rolling circle amplification**

Researchers at Uppsala University have demonstrated a novel electrical sensor concept that uses rolling circle amplification (RCA) of DNA to bridge a 5 µm gap between two electrodes. Stretched RCA products are metalized to form metal wires that reduce the resistance from TOhm to Ohms. Combining RCA with electrical detection produces a highly specific and sensitive detection technique and unlike other sensors that are available on the market the readout for this sensor
should not be the limiting factor for the biomarker assay, since there is virtually no background noise to interfere with the readout.

9. The infrastructure’s significance to direct societal interests

Myfab’s premises are all openly available to a broad range of users from academia and industry. Students from the master programs can have access to the cleanrooms during their undergraduate studies and diploma projects, under the supervision of their supervisors and with the assistance of the cleanroom staff. This opportunity to gain relevant training in a real cleanroom environment is rather rare in the rest of the world, where the requirement typically is that you have started as a PhD student or have similar experience.

Myfab actively informs the public of the possibilities which micro and nanotechnology gives society in a popular form. Outreach activities include about 2500 visitors annually to Myfab cleanrooms. In particular, the guided tours to the cleanroom for students and the public during the Gothenburg Science festival and Future Friday event at KTH in Kista are very popular. The guided tours to the cleanroom are probably the activities which are the most fully booked of them all at both these events.

The educational aspect is important for society. Students and researchers educated in micro/nanotechnology within Myfab, who later proceed to private enterprises or public organisations, constitute efficient communicators of knowledge during many years. These persons are also important for Myfab’s network of experts and are competent procurers of projects etc.

10. The infrastructure’s significance to trade, industry and other commercial interests

Myfab was established to provide a research infrastructure that would help researchers to solve the grand challenges of the world today – climate change, energy supply, aging population, diseases etc. Technology on the micro and nano scale is very important in today’s electronics, automotive industry, cosmetics, hygiene, clothes, household products, food, sports and toys. Myfab is a supplier of competence needed to increase the competitiveness for Swedish industry, create jobs, improve healthcare and by making better use of the world’s resources. Research in these areas is fundamental also to provide state-of-the-art education, attract the best students and so on.

About 30 spin-off companies have been created from research activities within Myfab during the last five years. Spin-off companies from Myfab have a turnover of more than 500 MSEK. Myfab has served about 120 companies during the last 5-year period with cleanroom access, process service etc. Several of these companies have special agreements and rent cleanroom space and install their own equipment in the cleanrooms. Myfab supports a scientific approach to understand and avoid possible safety risks related to nanotechnology.

It is of central importance for Swedish industry to have access to highly educated staff within the growing field of nanotechnology. Such an education must be experimentally hardware-oriented and here, Myfab’s flexibility suits the purpose very well.
ANNEX

A. Key numbers from Myfab LIMS for 2012

B. Publication lists from UU MSL, Chalmers MC2 NFL and KTH Electrum Lab
Annex A – Myfab LIMS statistics 2012

Statistics from Myfab’s LIMS system has been accumulated in the same manner at Myfab’s three cleanroom laboratories since 1 January 2008. The table below has been used as Myfab’s standard LIMS table for five full years now.
### MyFab Report

#### Statistics for 2012

<table>
<thead>
<tr>
<th>Tool</th>
<th>Electrum</th>
<th>MSL</th>
<th>NFL</th>
<th>MyFab</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>385</td>
<td>340</td>
<td>369</td>
<td>1094</td>
</tr>
<tr>
<td></td>
<td>207</td>
<td>214</td>
<td>209</td>
<td>620</td>
</tr>
<tr>
<td></td>
<td>42</td>
<td>65</td>
<td>39</td>
<td>146</td>
</tr>
<tr>
<td></td>
<td>20%</td>
<td>30%</td>
<td>19%</td>
<td>23%</td>
</tr>
</tbody>
</table>

#### Historic values for MyFab

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2010</th>
<th>2009</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users with access:</td>
<td>1040</td>
<td>982</td>
<td>906</td>
<td>841</td>
</tr>
<tr>
<td>Active users:</td>
<td>622</td>
<td>573</td>
<td>524</td>
<td>493</td>
</tr>
<tr>
<td>Female active users:</td>
<td>145</td>
<td>127</td>
<td>108</td>
<td>108</td>
</tr>
<tr>
<td>Gender balance, active users:</td>
<td>23%</td>
<td>22%</td>
<td>21%</td>
<td>22%</td>
</tr>
</tbody>
</table>

#### Number of active users from:

<table>
<thead>
<tr>
<th>Category</th>
<th>University</th>
<th>Institute</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universities</td>
<td>155</td>
<td>178</td>
<td>192</td>
</tr>
<tr>
<td>Institutes</td>
<td>23</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Commercial</td>
<td>29</td>
<td>36</td>
<td>14</td>
</tr>
</tbody>
</table>

#### Number of companies with own personnel:

<table>
<thead>
<tr>
<th>Category</th>
<th>University</th>
<th>Institute</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universities</td>
<td>14</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>Commercial</td>
<td>44</td>
<td>43</td>
<td>38</td>
</tr>
</tbody>
</table>

#### Number of booked hours:

<table>
<thead>
<tr>
<th>Category</th>
<th>University</th>
<th>Institute</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universities</td>
<td>42611</td>
<td>29304</td>
<td>65276</td>
</tr>
<tr>
<td>Commercial</td>
<td>3996</td>
<td>2166</td>
<td>1346</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>University</th>
<th>Institute</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booked hours</td>
<td>112338</td>
<td>110513</td>
<td>1103706</td>
</tr>
<tr>
<td>Commercial</td>
<td>17346</td>
<td>16546</td>
<td>16054</td>
</tr>
<tr>
<td>Commercial</td>
<td>7506</td>
<td>7470</td>
<td>6310</td>
</tr>
<tr>
<td>Commercial</td>
<td>330</td>
<td>285</td>
<td>276</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>University</th>
<th>Institute</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of tools</td>
<td>230</td>
<td>191</td>
<td>194</td>
</tr>
<tr>
<td>Commercial</td>
<td>328</td>
<td>291</td>
<td>285</td>
</tr>
</tbody>
</table>
Annex B – Myfab Publications 2012

UPPSALA UNIVERSITY – MICROSTRUCTURE LABORATORY (MSL)


31. Cai Y, Engqvist H, Strømme M, Welch K. TiO<sub>2</sub> surface for biofilm elimination, quantified by a novel method. In: 9th World Biomaterials Congress, June 1-6, Chengdu, China. 9th World Biomaterials Congress, June 1-6, Chengdu, China. 2012.


42. Dahlin A P. Protein digestion, like you never seen it before. Identification and quantification of femtomole amounts of proteins adsorbed onto microdialysis membranes using on surface enzymatic digestion (oSED) in conjunction with isobaric tagging, nanoliquid chromatography and tandem mass spectrometry. Heidelberg: Springer; 2012.


60. Forsgren J, Paz M D, León B, Engqvist H. Laser induced surface structuring and ion conversion in the surface oxide of titanium : possible implications for the wetability of laser
binders in combination with nanocrystalline diamond for use in high-sensitivity biosensors.
Analytical and Bioanalytical Chemistry. 2012;404(6-7):1643-1651.
 transient phase gratings for probing ultra-fast carrier generation and recombination
layer deposition of Pt films. Journal of Semiconductors. 2012;33(8):083003-.
for Design and Test of a 352 MHz Spoke RF Source. Uppsala: Department of Physics and
65. Grandfield K, Engqvist H. Focused ion beam in the study of biomaterials and biological
matter. Advances in Materials Science and Engineering. 2012;;841961-.
characterization of the hydroxyapatite-coated pedicle screw and human bone interface.
67. Grandfield K, Palmquist A, Engqvist H, Thomsen P. Resolving the CaP-bone interface: A
68. Grandfield K, Palmquist A, Engqvist H. High-resolution three-dimensional probes of
Ti6Al4V and bone interface revealed with STEM tomography. Ultramicroscopy. 2012;
response to free form fabricated hydroxyapatite and zirconia scaffolds: a
transmission electron microscopy study in the human maxilla. Clinical Implant Dentistry and
71. Grandfield K, Pujari S, Ott M, Engqvist H, Xia W. Mesoporous titania implant coatings with
and without calcium and strontium ion incorporation. Scandinavian Society for Biomaterials
(ScSB) Annual Meeting. 2012.
72. Grandfield K. Nanoscale Osseointegration: Characterization of Biomaterials and their
Interfaces with Electron Tomography. [Thesis]. Uppsala: Acta Universitatis Upsaliensis;
2012. Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of
Science and Technology, 962.
73. Green S V, Pehlivan E, Granqvist C, Niklasson G A. Electrochromism in sputter deposited
properties of nickel oxide based thin films sputter deposited in the presence of water vapor.


Holmqvist A, Törndahl T, Stenström S. A model-based methodology for the analysis and design of atomic layer deposition processes—Part II: Experimental validation and mechanistic analysis. Chemical Engineering Science. 2012;


Hulsart-Billström G, Carlsson E, Larsson S, Xia W, Engqvist H. In vivo and in vitro
performance of Sr-doped hydroxyapatite composite in the form of hollow nano-spheres.


129. Lekholm V, Palmer K, Thornell G. Schlieren Imaging of Microthruster Exhausts for Qualitative and Quantitative Analysis. Institute of Physics (IOP); Measurement science and technology. 2012;23(8):085403-.


142. Lindahl J, Wätjen J T, Hultqvist A, Ericson T, Edoff M, Törndahl T. The effect of Zn<sub>1-x</sub>Sn<sub>x</sub>O<sub>y</sub> buffer layer thickness in 18.0% efficient Cd-free Cu(In,Ga)Se<sub>2</sub> solar cells. Progress in Photovoltaics. 2012;


162. Moreira M, Bjurström J. Synthesis and characterization of wurtzite Al$_{(1-x)}$Sc$_x$N thin films. In: International Symposium on Ultrasonics, ferroelectrics and frequency control. International Symposium on Ultrasonics, ferroelectrics...
and frequency control. 2012.


177. Palmquist A, Grandfield K, Norlindh B, Mattson T, Brånemark R, Thomsen P. Bone-


189. Rubino S, Akhtar S, Melin P, Searle A, Spellward P, Leifer K. A site-specific focused-


198. Schöldström J, Zimmermann U, Edoff M. Determination of the optical constants for Cu(In,Ga)Se<sub>2</sub> and Cu<sub>x</sub>Se in the IR region. Institute of Physics Publishing (IOPP); Journal of Physics D. 2012;45(11):115101-.


and Expo on Advanced Ceramics and Composites. 36th International Conference and Expo on Advanced Ceramics and Composites. 2012.


CHALMERS – NANOFABROICATION LABORATORY (NFL)


5. Akabli, H., Almaggoussi, A., Abounadi, A., Rajira, A., Berland, Kristian, & Andersson, Thorvald, 'Intersubband energies in Al1-yInyN/ Ga1-xInxN heterostructures with lattice constant close to aGaN', *Superlattices and Microstructures* vol. 52, no. 1, s. 70-77, 2012


9. Andersson, Michael, Habibpour, Omid, Vukusic, Josip, & Stake, Jan, *Noise Figure Characterization of a Subharmonic Graphene FET Mixer*, 2012


17. Bridges, F, Castillo-Torrres, J., Car, B., Medling, S., & Kozina, M., 'EXAFS Evidence for a Primary Zn Li Dopant in LiNbO 3 ', *Physical Review B* vol. 85, no. 62012


20. Carlberg, Björn, Ye, L. L., & Liu, Johan, 'Polymer-metal
nanofibrous composite for thermal management of microsystems', *Materials Letters* vol. 75, s. 229-232, 2012


31. Fagerlind, Martin, & Rorsman, Niklas, 'Illumination effects on electrical characteristics of GaN/AlGaN/GaN heterostructures and heterostructure field effect transistors and their elimination by proper surface passivation', Journal of Applied Physics vol. 112, no. 12012


34. Fu, Yifeng, Chen, Si, Bielecki, Johan, Matic, Aleksandar, Wang, Teng, Ye, L. L., & Liu, Johan, 'Selective growth of double-walled carbon nanotubes on gold films', Materials Letters vol. 72, , s. 78-80, 2012


37. Gao, Zhaoli, Zhang, Yong, Fu, Yifeng, Yuen, Matthew, & Liu, Johan, Graphene Heat Spreader for Thermal Management of Hot Spots in Electronic Packaging, 2012

38. Gevorgian, Spartak, & Vorobiev, Andrei, Tunable FBARs: Intrinsic

40. Gustafsson, Martin, Santos, Paulo V., Johansson, Göran, & Delsing, Per, 'Local probing of propagating acoustic waves in a gigahertz echo chamber', Nature Physics vol. 8, , s. 338–343, 2012

41. Gutt, T., Malakowski, T., Przewlocki, H. M., Engström, Olof, Bakowski, M., & Esteve, R., 'Investigation of gate edge effects on interface traps densities in 3C-SiC MOS capacitors', Material Science and Engineering B vol. 177, , s. 1327, 2012

42. Gutt, T., Malachowski, T., Prewlocki, H. M., Engström, Olof, Bakowski, M., & Esteve, R., 'The influence of gate material, SiO2 fabrication method and gate edge effect on interface trap density in 3C-SiC MOS capacitors', Material Science Forum vol. 117, , s. 109, 2012

43. Habibpour, Omid, Vukusic, Josip, & Stake, Jan, 'A Large Signal Graphene FET Model', IEEE Transactions on Electron Devices vol. 59, no. 4, s. 968 - 975, 2012

44. Habibpour, Omid, Cherednichenko, Sergey, Vukusic, Josip, Yhland, Klas, & Stake, Jan, 'A subharmonic graphene FET mixer', IEEE Electron Device Letters vol. 33, no. 1, s. 71-73, 2012


48. Haglund, Erik, Haglund, Åsa, Gustavsson, Johan, Kögel, Benjamin, Westbergh, Petter, & Larsson, Anders, Reducing the spectral width of high speed oxide confined VCSELs using an integrated mode filter,
49. Hashemi, Seyed Ehsan, Gustavsson, Johan, Bengtsson, Jörgen, Stattin, Martin, Larsson, Anders, Cosendey, Gatien, Grandjean, Nicolas, & Haglund, Åsa, *Engineering the transverse optical guiding in GaN-based VCSELs to avoid detrimental optical loss*, 2012


55. Jansen, R., Dash, Saroj Prasad, Sharma, S., & Min, B. C., 'Silicon spintronics with ferromagnetic tunnel devices', *Semiconductor Science and Technology* vol. 27, no. 82012


2012


59. Jiang, Di, Wang, Teng, Ye, Li-Lei, Jeppson, Kjell, & Liu, Johan, 'Carbon Nanotubes in Electronics Interconnect Applications with a Focus on 3D-TSV Technology', *ECS Transactions* vol. 44, no. 1, s. 683-692, 2012

60. Jiang, Di, Ye, Li-Lei, Jeppson, Kjell, & Liu, Johan, *Electrical Interconnects Made of Carbon Nanotubes: Applications in 3D Chip Stacking*, 2012


66. Khatab, A., Shafi, M., Mari, R.H., Aziz, M., Henini, M., Patriarche, G., Troadee, D., Sadeghi, Mahdad, & Wang, Shumin, 'Comparative Optical Studies of InGaAs/GaAs Quantum Wells Grown by MBE on (100) and (311)A GaAs Planes', *Physica Status Solidi c* vol. 9, s. 1621,
67. Khatab, A., Henini, M., Patriarche, G., Troadec, D., Sadeghi, Mahdad, & Wang, Shumin, *Effect of nitrogen on the optical and structural properties of dilute GaInNAs double quantum wells grown by MBE on (100), (311)A and (311)B GaAs substrates*, 2012


75. Lindahl, Niklas, Midtvedt, Daniel, Svensson, Johannes, Nerushiev, O. A., Lindvall, Niclas, Isaacsson, Andreas, & Campbell, Eleanor E B, 'Determination of the Bending Rigidity of Graphene via Electrostatic Actuation of Buckled Membranes', *Nano Letters* vol. 12, no. 7, s. 3526-
76. Lindvall, Niclas, Kalaboukhov, Alexei, & Yurgens, August, 'Cleaning graphene using atomic force microscope', *Journal of Applied Physics* vol. 111, no. 6, s. Article Number: 064904, 2012

77. Lindvall, Niclas, Sun, Jie, Galib, O.F.M.Abdul, & Yurgens, August, 'Towards transfer-free fabrication of graphene NEMS grown by chemical vapour deposition', *Micro & Nano Letters* vol. 7, no. 8, s. 749-752, 2012

78. Lindvall, Niclas, Sun, Jie, & Yurgens, August, *Transfer-free fabrication of suspended graphene grown by chemical vapor deposition*, 2012


85. Moschetti, Giuseppe, Wadefalk, Niklas, Nilsson, Per-Åke, Abbasi,


88. Naboka, Olga, Kuzmenko, Volodymyr, Sanz-Velasco, Anke, Lundgren, Per, Enoksson, Peter, & Gatenholm, Paul, *Carbon Nanofibers with Controlled Properties Synthesized from Electrospun Cellulose*, 2012


91. Nam, Y., Yoo, J. S., Park, Y. W., Lindvall, Niclas, Bauch, Thilo, & Yurgens, August, 'The Aharonov-Bohm effect in graphene rings with metal mirrors', *Carbon* vol. 50, no. 15, s. 5562-5568, 2012


94. Panchal, V., Cedergren, Karin, Yakimova, R., Tzalenchuk, A., Kubatkin, Sergey, & Kazakova, O., 'Small epitaxial graphene devices for magneto sensing applications', *Journal of Applied Physics (//PROCEEDINGS OF THE 56TH ANNUAL CONFERENCE ON MAGNETISM*


103. Rodilla, Helena, Gonzalez, Tomas, Moschetti, Giuseppe, Grahn, Jan, & Mateos, Javier, 'Monte Carlo study of the noise performance of
isolated-gate InAs/AlSb HEMTs', *Semiconductor Science and Technology* vol. 27, no. 1, s. 015008, 2012

104. Rodilla, Helena, Schleeh, Joel, Nilsson, Per-Åke, & Grahn, Jan, *Optimized InP HEMTs for low noise at cryogenic temperatures*, 2012


113. Stake, Jan, Bryllert, Tomas, Dahlbäck, Robin, Drakinskiy, Vladimir,
Hanning, Johanna, Malko, Aleksandra, Tang, Aik Yean, Vukusic, Josip, Zhao, Huan, & Sobis, Peter, *Integrated terahertz electronics for imaging and sensing*, 2012

114. Stattin, Martin, Lockhart de la Rosa, César Javier, Sun, Jie, Yurgens, August, Larsson, Anders, & Haglund, Åsa, *Graphene as transparent electrode for GaN-based VCSELs*, 2012


118. Sun, Jie, Lindvall, Niclas, Cole, M.T., Teo, K.B.K., & Yurgens, August, *Chemical vapor deposition of nanocrystalline graphene directly on arbitrary high-temperature insulating substrates*, 2012

119. Sun, Jie, Lindvall, Niclas, Cole, M. T., Wang, Teng, Booth, T. J., Boggild, P., Teo, K. B. K., Liu, Johan, & Yurgens, August, 'Controllable chemical vapor deposition of large area uniform nanocrystalline graphene directly on silicon dioxide', *Journal of Applied Physics* vol. 111, no. 42012


121. Sun, Jie, Lindvall, Niclas, Cole, Matthew, Angel, Koh, Wang, Teng, Teo, Ken, Chua, Daniel, Liu, Johan, & Yurgens, August, 'Low Partial Pressure Chemical Vapor Deposition of Graphene on Copper', *IEEE Transactions on nanotechnology* vol. 11, no. 2, s. 255-260, 2012
122. Sun, Jie, Cole, M. T., Lindvall, Niclas, Teo, K. B. K., & Yurgens, August, 'Noncatalytic chemical vapor deposition of graphene on high-temperature substrates for transparent electrodes', Applied Physics Letters vol. 100, no. 22012

123. Sun, S., Xin, L., Zandén, Carl, Carlberg, Björn, Ye, L., & Liu, Johan, Thermal performance characterization of nano thermal interface materials after power cycling, 2012

124. Sun, Shangxi, Mu, Wei, Zhang, Yan, Carlberg, Björn, Ye, Li-Lei, & Liu, Johan, Dissipating Heat from Hot Spot Using a New Nano Thermal Interface Material, 2012


127. Tang, Aik Yean, Bryllert, Tomas, & Stake, Jan, Geometry Optimization of THz Sub-harmonic Schottky Mixer Diodes, 2012

128. Vasallo, B. G., Rodilla, Helena, Gonzalez, T., Moschetti, Giuseppe, Grahn, Jan, & Mateos, J., 'Kink effect and noise performance in isolated-gate InAs/AlSb high electron mobility transistors', Semiconductor Science and Technology vol. 27, no. 6, s. Article Number: 065018, 2012


130. Vorobiev, Andrei, & Gevorgian, Spartak, Improved Tunable Performance of high Q-factor Ba$_2$Sr$_{1-x}$TiO$_3$ Film Bulk Acoustic Wave Resonators, 2012

131. Vorobiev, Andrei, Gevorgian, Spartak, Martirosyan, Norayr, Löffler, Markus, & Olsson, Eva, 'Intrinsically tunable 0.67 BiFeO 3 -0.33

133. Vorobiev, Andrei, & Gevorgian, Spartak, *Microwave characterization of intrinsically tunable FBARs*, 2012


135. Vukusic, Josip, Bryllert, Tomas, Olsen, Arne Øistein, Hanning, Johanna, & Stake, Jan, 'Monolithic HBV-Based 282-GHz Tripler With 31-mW Output Power', *IEEE Electron Device Letters* vol. 33, no. 6, s. 800-802, 2012

136. Wallin, Patric, Zandén, Carl, Carlberg, Björn, Erkenstam, Nina Hellström, Liu, Johan, & Gold, Julie, 'A method to integrate patterned electrospun fibers with microfluidic systems to generate complex microenvironments for cell culture applications', *Biomicrofluidics* vol. 6, no. 22012

137. Wallin, Patric, Zandén, Carl, Carlberg, Björn, Liu, Johan, & Gold, Julie, *Patterned electrospun microfibers integrated in a microfluidic system to study cells in complex microenvironments*, 2012

138. Wang, Nan, Murugesan, Murali, Ye, L., Carlberg, Björn, Chen, Si, & Liu, Johan, *Reliability investigation of nano-enhanced thermal conductive adhesives*, 2012


142. Westbergh, Petter, Safaisini, Rashid, Haglund, Erik, Kögel,
Benjamin, Gustavsson, Johan, Larsson, Anders, & Joel, Andrew, *High-speed 850 nm VCSELs with 28 GHz modulation bandwidth*, 2012

143. Westbergh, Petter, Safaisini, Rashid, Haglund, Erik, Kögel, Benjamin, Gustavsson, Johan, Larsson, Anders, Geen, M., Lawrence, R., & Joel, A., 'High-speed 850 nm VCSELs with 28 GHz modulation bandwidth operating error-free up to 44 Gbit/s', *Electronics Letters* vol. 48, no. 18, s. 1145-U178, 2012


146. Ye, Hong, Song, Yuxin, Sadeghi, Mahdad, Gu, Yi, & Wang, Shumin, *High quality strain-compensated multiple InAs/GaAs quantum dot layers grown by MBE*, 2012

147. Ye, Hong, Song, Yuxin, Gu, Yi, & Wang, Shumin, *Light Emission from InGaAs/GaAs Quantum Wells at 1.3 μm Using Bi as Surfactant*, 2012

148. Ye, Hong, Song, Yuxin, Gu, Yi, & Wang, Shumin, 'Light emission from InGaAs:Bi/ GaAs quantum wells at 1.3 μm', *AIP Advances* vol. 2, no. 4, s. 042158, 2012


150. Zhao, Huan, Drakinskiy, Vladimir, Sobis, Peter, Hanning, Johanna, Bryllert, Tomas, Tang, Aik Yean, & Stake, Jan, *Development of a 557 GHz GaAs monolithic membrane-diode mixer*, 2012


152. de Graaf, Sebastian Erik, Danilov, Andrey, Adhamyan, Astghik, Bauch, Thilo, & Kubatkin, Sergey, 'Magnetic field resilient superconducting fractal resonators for coupling to free spins', *Journal*


169.


171.


M.Sc. Theses 2012


5. FESENKO, PAVLO, Capacitive micromachined ultrasonic transducer (cMUT) for biometric applications. 2012


10. MINSHU XIE, Nanoscience and Nanotechnology, Development of tunable film bulk acoustic wave resonator (FBAR) utilizing BiFeO3-BaTiO3 multiferroics. 2012


Lic.Eng. Theses 2012


**Ph.D. Theses 2012**


5. Fagerlind, Martin, *Characterization and Analysis of Surface Passivations and Gate Insulators for AlGaN/GaN Microwave HFETs*, Chalmers University of Technology, Göteborg, 2012


1. Shapiro, Boris; Tater, Milos; TAKEMURA, KOICHI, ON SPECTRAL POLYNOMIALS OF THE HEUN EQUATION. II.,Communications in Mathematical Physics 0010-3616,311,2,277-300,2012

2. Jönsson, Håkan; Zhang, Chi; Uhlén, Mathias; Andersson-Svahn, Helene,A Homogeneous Assay for Protein Analysis in Droplets by Fluorescence Polarization,Electrophoresis 0173-0835,33,3,436-439,2012


4. Das, Prabir Kumar; Tasdemir, Yuksel; Birgisson, Björn,Low temperature cracking performance of WMA with the use of the Superpave indirect tensile test,Construction and Building Materials 0950-0618,30,,643-649,2012


9. Hertz, Hans; von Hofsten, Olov; Bertilson, Mikael; Vogt, Ulrich; Holmberg, Anders; Reinspach, Julia Antonia; Martz, Dale; Selin, Mårten; Christakou, Athanasia; Jerlström-Hultqvist, J; Svärd, S,Laboratory cryo soft X-ray microscopy,Journal of Structural Biology 1047-8477,177,2,267-272,2012

10. Pasiskevicius, Valdas; Strömqvist, Gustav; Laurell, Fredrik; Canalias, Carlota,Quasi-phase matched nonlinear media : Progress towards nonlinear optical engineering,Optical materials (Amsterdam) 0925-3467,34,3,513-523,2012
11. Saleemi, Mohsin; Toprak, Muhammet S.; Li, Shanghua; Johnsson, Mats; Muhammed, Mamoun, Synthesis, processing, and thermoelectric properties of bulk nanostructured bismuth telluride (Bi(2)Te(3)), Journal of Materials Chemistry 0959-9428, 22, 2, 725-730, 2012

12. Stoeppler, Georg; Thilmann, Nicky; Pasiskevicius, Valdas; Zukauskas, Andrius; Canalias, Carlota; Eichhorn, Marc, Tunable Mid-infrared ZnGeP2 RISTRA OPO pumped by periodically-poled Rb:KTP optical parametric master-oscillator power amplifier, Optics Express 1094-4087, 20, 4, 4509-4517, 2012

13. Fan, Liangdong; Zhu, Bin; Chen, Mingming; Wang, Chengyang; Raza, Rizwan; Qin, Haiying; Wang, Xuetao; Wang, Xiaodi; Ma, Ying, High performance transition metal oxide composite cathode for low temperature solid oxide fuel cells, Journal of Power Sources 0378-7753, 203, 1, 65-71, 2012

14. Lopez Cabezas, Ana; Liu, Xianjie; Chen, Qiang; Zhang, Shi-Li; Zheng, Li-Rong; Zhang, Zhi-Bin, Influence of Carbon Nanotubes on Thermal Stability of Water-Dispersible Nanofibrillar Polyaniline/Nanotube Composite, Materials 1996-1944, 5, 2, 327--335, 2012

15. Kolahdouz, Mohammadreza; Östling, Mikael; Radamson, Henry H., High performance infra-red detectors based on Si/SiGe multilayers quantum structure, Materials Science & Engineering 0921-5107, 177, 17, 1563-1566, 2012

16. Wang, Zhechao; Junesand, Carl; Metaferia, Wondwosen; Hu, Chen; Wosinski, Lech; Lourdudoss, Sebastian, III-Vs on Si for photonic applications-A monolithic approach, Materials Science & Engineering 0921-5107, 177, 17, 1551-1557, 2012

17. Fischer, Andreas C.; Gradin, Henrik; Schröder, Stephan; Braun, Stefan; Stemme, Göran; van der Wijngaart, Wouter; Niklaus, Frank, Wire-bonder-assisted integration of non-bondable SMA wires into MEMS substrates, Journal of Micromechanics and Microengineering 0960-1317, 22, 5, 055025-, 2012


20. Dong, Lin; Ye, Fei; Chughtai, Adnan; Popov, Sergei; Friberg, Ari T.; Muhammed, Mamoun, Photostability of lasing process from water solution of Rhodamine 6G with gold nanoparticles, Optics Letters 0146-9592, 37, 1, 34-36, 2012

22. Hormozan, Yashar; Yun, Sang-Ho; Svenonius, Olof; Linnros, Jan, Towards High-Resolution X-Ray Imaging Using a Structured Scintillator, IEEE Transactions on Nuclear Science 0018-9499, 59, 1, 19-23, 2012


25. Sanatinia, Reza; Swillo, Marcin; Anand, Srinivasan, Surface Second-Harmonic Generation from Vertical GaP Nanopillars, Nano letters (Print) 1530-6984, 12, 2, 820-826, 2012

26. Strömqvist, Gustav; Pasiskevicius, Valdas; Canalias, Carlota; Aschieri, Pierre; Picozzi, Antonio; Montes, Carlos, Temporal coherence in mirrorless optical parametric oscillators, Journal of the Optical Society of America. B, Optical physics 0740-3224, 29, 6, 1194-1202, 2012

27. Jalalian, Abolfazl; Grishin, Alexander M., Biocompatible ferroelectric (Na,K)NbO(3) nanofibers, Applied Physics Letters 0003-6951, 100, 1, 012904-, 2012


32. Chen, Xi; Chen, Yiting; Yan, Min; Qiu, Min, Nanosecond Photothermal Effects in Plasmonic Nanostructures, ACS Nano 1936-0851, 6, 3, 2550-2557, 2012

33. Moschetti, Giuseppe; Nilsson, Per-Åke; Hallén, Anders; Desplanque, Ludovic; Wallart, Xavier; Grahn, Jan, Planar InAs/AlSb HEMTs With Ion-Implanted Isolation, IEEE Electron Device Letters 0741-3106, 33, 4, 510-512, 2012
34. Song, Yuxin; Wang, Shumin; Roy, Ivy Saha; Shi, Peixiong; Hallén, Anders, Growth of GaSb1-xBix by molecular beam epitaxy, Journal of Vacuum Science & Technology B 1071-1023, 30, 2, 02B114-, 2012

35. Fröberg, Ralf; Ottaviani, Giorgio; Shapiro, Boris, On the Waring problem for polynomial rings, Proceedings of the National Academy of Sciences of the United States of America 0027-8424, 109, 15, 5600-5602, 2012


38. Feng, Peizhong; Liu, Weisheng; Farid, Akhtar; Wu, Jie; Niu, Jinan; Wang, Xiaohong; Qiang, Yinhua; Combustion synthesis of (Mo1-xCrx)Si2 (x=0.00-0.30) alloys in SHS mode, Advanced Powder Technology 0921-8831, 23, 2, 133-138, 2012

39. Antelius, Mikael; Fischer, Andreas C.; Niklaus, Frank; Stemme, Göran; Roxhed, Niclas, Hermetic integration of liquids using high-speed stud bump bonding for cavity sealing at the wafer level, Journal of Micromechanics and Microengineering 0960-1317, 22, 4, 045021-, 2012


41. Buono, Benedetto; Ghandi, Reza; Domeij, Martin; Malm, Gunnar; Zetterling, Carl-Mikael; Östling, Mikael, Investigation of Current Gain Degradation in 4H-SiC Power BJTs, Materials Science Forum 0255-5476, 717/720,, 1131-1134, 2012

42. Karlsson, J. Mikael; Haraldsson, Tommy; Carlborg, Carl Fredrik; Hansson, Jonas; Russom, Aman; van der Wijngaart, Wouter, Fabrication and transfer of fragile 3D PDMS microstructures, Journal of Micromechanics and Microengineering 0960-1317, 22, 8, 085009-, 2012

43. Karlsson, J. Mikael; Haraldsson, Tommy; Carlborg, Carl Fredrik; van der Wijngaart, Wouter, Low-stress transfer bonding using floatation, Journal of Micromechanics and Microengineering 0960-1317, 22, 7, 075005-, 2012

44. Hansson, Jonas; Karlsson, J. Mikael; Haraldsson, Tommy; Brismar, Hjalmar; van der Wijngaart, Wouter; Russom, Aman, Inertial microfluidics in parallel channels for high-throughput applications, Lab on a Chip 1473-0197, 12, 22, 4644-4650, 2012

46. Zhao, Yichen; Sugunan, Abhilash; Rihtnesberg, David B.; Wang, Qin; Toprak, Muhammet S.; Muhammed, Mamoun, Size-tuneable synthesis of photoconducting poly-(3-hexylthiophene) nanofibres and nanocomposites, Physica Status Solidi. C, Current topics in solid state physics 1610-1634, 9, 7, 1546-1550, 2012

47. Forsberg, Fredrik; Roxhed, Niclas; Haraldsson, Tommy; Liu, Yitong; Stemme, Göran; Niklaus, Frank, Batch Transfer of Radially Expanded Die Arrays for Heterogeneous Integration Using Different Wafer Sizes, Journal of microelectromechanical systems 1057-7157, 21, 5, 1077-1083, 2012

48. Wang, Xiaodi; Ma, Ying; Li, Shanghua; Zhu, Bin; Muhammed, Mamoun, SDC/Na2CO3 nanocomposite: New freeze drying based synthesis and application as electrolyte in low-temperature solid oxide fuel cells, International journal of hydrogen energy 0360-3199, 37, 24, 19380-19387, 2012

49. Wang, Xiaodi; Ma, Ying; Zhu, Bin, State of the art ceria-carbonate composites (3C) electrolyte for advanced low temperature ceramic fuel cells (LTCFCs), International journal of hydrogen energy 0360-3199, 37, 24, 19417-19425, 2012


52. Li, Jiantong; Ye, Fei; Vaziri, Sam; Muhammed, Mamoun; Lemme, Max C.; Östling, Mikael, A simple route towards high-concentration surfactant-free graphene dispersions, Carbon 0008-6223, 50, 8, 3113-3116, 2012

53. Ye, Fei; Laurent, Sophie; Fornara, Andrea; Astolfi, Laura; Qin, Jian; Roch, Alain; Martini, Alessandro; Toprak, Muhammet; Muller, Robert N.; Muhammed, Mamoun, Uniform mesoporous silica coated iron oxide nanoparticles as a highly efficient, nontoxic MRI T2 contrast agent with tunable proton relaxivities, Contrast Media & Molecular Imaging 1555-4309, 7, 5, 460-468, 2012

54. Dong, Lin; Ye, Fei; Chughtai, Adnan; Liuolia, Vytautas; Popov, Sergei; Friberg, Ari T.; Muhammed, Mamoun, Lasing From Water Solution of Rhodamine 6G/Gold


56. Xu, Cheng; Danielsson, Mats; Karlsson, Staffan; Svensson, Christer; Bornefalk, Hans, Preliminary evaluation of a silicon strip detector for photon-counting spectral CT, Nuclear Instruments and Methods in Physics Research Section A 0168-9002, 677, 45-51, 2012

57. Fischer, Andreas C.; Belova, Lyubov M.; Malm, Gunnar B.; Kolahdouz, Mohammadreza; Radamson, Henry; Gylfason, Kristinn B.; Stemme, Göran; Niklaus, Frank, 3D Free-Form Patterning of Silicon by Ion Implantation, Silicon Deposition, and Selective Silicon Etching, Advanced Functional Materials 1616-301X, 22, 19, 4004-4008, 2012

58. Bykov, Igor; Bergsåker, Henric; Ogata, Douglas; Petersson, Per; Ratynskaia, Svetlana, Collection of mobile dust in the T2R reversed field pinch, Nukleonika 0029-5922, 57, 1, 55-60, 2012


60. Levenius, Martin; Conforti, Matteo; Baronio, Fabio; Pasiskevicius, Valdas; Laurell, Fredrik; De Angelis, Costantino; Gallo, Katia, Multistep quadratic cascading in broadband optical parametric generation, Optics Letters 0146-9592, 37, 10, 1727-1729, 2012

61. Das, Prabir Kumar; Tasdemir, Yuksel; Birgisson, Björn, Evaluation of fracture and moisture damage performance of wax modified asphalt mixtures, International Journal on Road Materials and Pavement Design 1468-0629, 13, 1, 142-155, 2012


63. Lapisa, Martin; Zimmer, Fabian; Stemme, Göran; Gehner, Andreas; Niklaus, Frank, Drift-free micromirror arrays made of monocrystalline silicon for adaptive optics applications, Journal of microelectromechanical systems 1057-7157, 21, 4, 959-970, 2012

64. Platz, Daniel; Forchheimer, Daniel; Tholen, Erik A.; Haviland, David B., The role of nonlinear dynamics in quantitative atomic force microscopy, Nanotechnology 0957-4484, 23, 26, 265705-, 2012

66. Naiini, Maziar M.; Henkel, Christoph; Malm, Gunnar B.; Östling, Mikael, ALD high-k layer grating couplers for single and double slot on-chip SOI photonics, Solid-State Electronics 0038-1101, 74, 58-63, 2012

67. Henkel, Christoph; Hellström, Per-Erik; Östling, Mikael; Stoeger-Pollach, Michael; Bethge, Ole; Bertagnolli, Emmerich, Impact of oxidation and reduction annealing on the electrical properties of Ge/La2O3/ZrO2 gate stacks, Solid-State Electronics 0038-1101, 74, 7-12, 2012

68. Östling, Mikael; Malm, B. Gunnar, SELECTED PAPERS FROM THE ESSDERC 2011 CONFERENCE Foreword, Solid-State Electronics 0038-1101, 74, 1-1, 2012

69. Asencio, Rubén Alvarez; Cranston, Emily D.; Atkin, Rob; Rutland, Mark W., Ionic Liquid Nanotribology: Stiction Suppression and Surface Induced Shear Thinning, Langmuir 0743-7463, 28, 26, 9967-9976, 2012

70. Feng, Yi; Lopez Cabezas, Ana; Chen, Qiang; Zheng, Li-Rong; Zhang, Zhi-Bin, Flexible UHF Resistive Humidity Sensors Based on Carbon Nanotubes, IEEE Sensors Journal 1530-437X, 12, 9, 2844-2850, 2012

71. Xie, Li; Mäntysalo, Matti; Lopez, Ana; Feng, Yi; Jonsson, Fredrik; Zheng, Li-Rong, Electrical performance and reliability evaluation of inkjet-printed Ag interconnections on paper substrates, Materials letters (General ed.) 0167-577X, 88, 68-72, 2012


73. Lanni, Luigia; Ghandi, Reza; Zetterling, Carl-Mikael; Malm, B. Gunnar; Östling, Mikael, Bipolar integrated OR-NOR gate in 4H-SiC, Materials Science Forum 0255-5476, 717-720, 1257-1260, 2012


79. Fischer, Andreas C.; Bleiker, Simon J.; Haraldsson, Tommy; Roxhed, Niclas; Stemme, Göran; Niklaus, Frank, Very high aspect ratio through-silicon vias (TSVs) fabricated using automated magnetic assembly of nickel wires, Journal of Micromechanics and Microengineering 0960-1317, 22, 10, 105001, 2012

80. Bethge, O.; Pozzovivo, G.; Henkel, Christoph; Abermann, S.; Bertagnolli, E., Fabrication of highly ordered nanopillar arrays and defined etching of ALD-grown all-around platinum films, Journal of Micromechanics and Microengineering 0960-1317, 22, 8, 085013, 2012

81. Hansson, Petra M.; Hormozan, Yashar; Brandner, B. D.; Linnros, Jan; Claesson, Per Martin; Swerin, Agne; Schoelkopf, J.; Gane, P. A. C.; Thorrmann, Esben, Effect of surface depressions on wetting and interactions between hydrophobic pore array surfaces, Langmuir 0743-7463, 28, 30, 11121-11130, 2012

82. Akhtar, Farid; Liu, Qingling; Hedin, Niklas; Bergström, Lennart, Strong and binder free structured zeolite sorbents with very high CO2-over-N2 selectivities and high capacities to adsorb CO2 rapidly, Energy & Environmental Science 1754-5692, 5, 6, 7664-7673, 2012


84. Motzkau, Holger; Jacobs, Thorsten; Katterwe, Sven-Olof; Rydh, Andreas; Krasnov, Vladimir M., Persistent electrical doping of Bi2Sr2CaCu2O8+x mesa structures, Physical Review B. Condensed Matter and Materials Physics 1098-0121, 85, 14, 144519, 2012

86. Nguyen, Thı Ngooc Ahn; Benatmane, Nadjib; Fallahi, Vahid; Fang, Yeyu; Mohseni, Seyed Majid; Dumas, R. K.; Åkerman, Johan; [Co/Pd][4]-Co-Pd-NiFe spring magnets with highly tunable and uniform magnetization tilt angles, Journal of Magnetism and Magnetic Materials 0304-8853,324,22,3929-3932,2012

87. Gustafsson, Oscar; Karim, Amir; Berggren, Jesper; Wang, Qin; Reuterskiöld-Hedlund, Carl; Ernerheim-Jokumsen, Christopher; Soldemo, Markus; Weissnrieder, Jonas; Persson, Sirpa; Almqvist, Susanne; Ekenberg, Ulf; Noharet, Bertrand; Asplund, Carl; Göthelid, Mats; Andersson, Jan Y.; Hammar, Mattias, Photoluminescence and photoresponse from InSb/InAs-based quantum dot structures, Optics Express 1094-4087,20,19,21264-21271,2012

88. Lou, Fei; Dai, Daoxin; Wosinski, Lech, Ultracompact polarization beam splitter based on a dielectric-hybrid plasmonic-dielectric coupler, Optics Letters 0146-9592,37,16,3372-3374,2012


91. Ansari, Nazanin; Khartsev, Sergiy; Grishin, Alexander, Multicolor filter all-garnet magneto-optical photonic crystals, Optics Letters 0146-9592,37,17,3552-3554,2012


94. Schmidt, Torsten; Chizhik, A. I.; Chizhik, A. M.; Potrick, K.; Meixner, A. J.; Huisken, F., Radiative exciton recombination and defect luminescence observed in single silicon nanocrystals, Physical Review B. Condensed Matter and Materials Physics 1098-0121,86,12,125302-,2012


97. Dånmark, Staffan; Gladnikoff, Micha; Frisk, Thomas; Zelenina, Marina; Mustafa, Kamal; Russom, Aman; Finne-Wistrand, Anna, Development of a novel microfluidic device for long-term in situ monitoring of live cells in 3-dimensional matrices, Biomedical microdevices (Print) 1387-2176, 14,5,885-893, 2012


99. Carville, N. Craig; Manzo, Michele; Damm, Signe; Castiella, Marion; Collins, Liam; Denning, Denise; Weber, Stefan; Gallo, Katia; Rice, James; Rodriguez, Brian, Photoreduction of SERS-Active Metallic Nanostructures on Chemically Patterned Ferroelectric Crystals, ACS Nano 1936-0851,6,,7373-7380, 2012

100. Laurell, Fredrik; Calmano, Thomas; Mueller, Sebastian; Zeil, Peter; Canalias, Carlota; Huber, Guenter, Laser-written waveguides in KTP for broadband Type II second harmonic generation, Optics Express 1094-4087,20,22,22308-22313,2012

101. Sanatinia, Reza; Awan, Kashif Masud; Naureen, Shagufta; Anttu, Nicklas; Ebraert, Evert; Anand, Srinivasan, GaAs nanopillar arrays with suppressed broadband reflectance and high optical quality for photovoltaic applications, Optical Materials Express 2159-3930,2,11,1671-1679,2012


103. Hu, Cheng; Xu, Peng; Fu, Chaochao; Zhi, Zhiwei; Gao, Xindong; Jamshidi, Asghar; Noroozi, Mohammad; Radamson, Henry; Wu, Dongping; Zhang, Shili, Characterization of Ni(Si,Ge) films on epitaxial SiGe(100) formed by microwave annealing, Applied Physics Letters 0003-6951,101,9,092101- , 2012

104. Bettini, Eleonora; Leygraf, Christofer; Lin, Changjian; Liu, Ping; Pan, Jinshan, Influence of Grain Boundaries on Dissolution Behavior of a Biomedical CoCrMo Alloy: In-Situ Electrochemical-Optical, AFM and SEM/TEM Studies, Journal of the Electrochemical Society 0013-4651,159,9,C422-C427,2012


scattering with large area position sensitive detector, Review of Scientific Instruments 0034-6748, 83, 9, 095107-, 2012

107. Shahid, Robina; Gorlov, Mikhail; El-Sayed, Ramy; Toprak, Muhammet S.; Sugunan, Abhilash; Kloog, Lars; Muhammed, Mamoun, Microwave assisted synthesis of ZnS quantum dots using ionic liquids, Materials Letters (General ed.) 0167-577X, 89, 316-319, 2012


113. Persson, Johan; Sani, Sohrab Redjai; Bonetti, Stefano; Magnusson, Fredrik; Pogorylov, Yevgen; Mohseni, Seyed Majid; Gunnarsson, Sten; Norling, Martin; Stoij, Christer; Åkerman, Johan, Spin-Torque Oscillator in an Electromagnet Package, IEEE transactions on magnetics 0018-9464, 48, 11, 4378-4381, 2012


115. Shapiro, Boris; Saldanha, Nicolau, Spaces of locally convex curves in Sn and combinatorics of the group B+ n+1, Journal of Singularities, 4, 1-22, 2012
116. Göthelid, Mats; Tymczenko, Michael; Chow, Winnie; Ahmadi, Sareh; Yu, Shun; Bruhn, Benjamin; Stoltz, Dunja; von Schenck, Henrik; Weissenrieder, Jonas; Sun, Chenghua, Surface concentration dependent structures of iodine on Pd(110), Journal of Chemical Physics 0021-9606, 137, 20, 204703-, 2012.


120. Iovan, Adrian; Fischer, Marco; Lo Conte, Roberto; Korenivski, Vladislav, Sub-10 nm colloidal lithography for circuit-integrated spin-photo-electronic devices, Beilstein Journal of Nanotechnology 2190-4286, 3, 884-892, 2012.


3. "Shah, Umer; Sterner, Mikael; Oberhammer, Joachim" RF MEMS RECONFIGURABLE FILTERS BASED ON MOVABLE SIDEWALLS OF A 3D MICROMACHINED TRANSMISSION LINE The GigaHertz 2012 Symposium, March 6-7, Stockholm, Sweden 2012

4. "Shah, Umer; Sterner, Mikael; Oberhammer, Joachim" TUNEABLE DIRECTIONAL COUPLERS IN 3D MICROMACHINED TRANSMISSION LINE FOR ULTRA-WIDEBAND APPLICATIONS The GigaHertz 2012 Symposium, March 6-7, Stockholm, Sweden 2012

5. "Mantysalo, Matti; Xie, Li; Jonsson, Fredrik; Feng, Yi; Cabezas, Ana Lopez; Zheng, Li-Rong" System integration of smart packages using printed electronics "2012 IEEE 62nd Electronic Components and Technology Conference, ECTC 2012; San Diego, CA;29 May 2012 through 1 June 2012" 2012

6. "Xie, Li; Mantysalo, Matti; Jonsson, Fredrik; Feng, Yi; Lopez, Ana; Zheng, Lirong" Inkjet Printing in System Integration - Printed Humidity Sensor-Box 2012 Flexible Electronics & Displays Conference 2012

7. "Manzo, Michele; Denning, Denise; Rodriguez, Brian J.; Gallo, Katia" Piezoresponse force microscopy on proton exchanged LiNbO3 layers Advances in Optical Materials, San Diego, CA. February 1, 2012 2012

8. "Levenius, Martin; Conforti, Matteo; Baronio, Fabio; Pasiskevicius, Valdas; Laurell, Fredrik; Gallo, Katia" Quadratic cascading effects in broadband optical parametric generation Advanced Solid-State Photonics - ASSP 2012

9. "Wosinski, Lech; Wang, Zhechao; Lou, Fei; Dai, Daoxin; Lourdudoss, Sebastian; Thyl'n, Lars" Advanced silicon device technologies for optical interconnects "Optoelectronic Integrated Circuits XIV; San Francisco, CA; 25 January 2012 through 26 January 2012" 2012

10. "Das, Prabir Kumar; Jelagin, Denis; Birgisson, Bjørn; Kringos, Nik" Micro-Mechanical Investigation of Low Temperature Fatigue

12. "Fischer, Andreas C.; Gylfason, Kristinn B.; Belova, Lyubov M.; Malm, Gunnar B.; Kolahdouz, Mohammadreza; Rikers, Yuri G.M.; Stemme, G"ran; Niklaus, Frank" 3D Patternning of Si Micro and Nano Structures by Focused Ion Beam Implantation, Si Deposition and Selective Si Etching The 56th International Conference on Electron, Ion, Photon Beam Technolog (EIPBN) 2012

13. "Pierer, J"rg; Stadelmann, Thomas; Bosshard, Christian; Volden, Tormod; Graf, Sigfried; Knapp, Helmut; úlvaraz, Jesus; Hill, Daniel; Cretich, Marina; Sola, Laura; Bettotti, Paolo; Kumar, Neeraj; Pavesi, Lorenzo; Saharil, Farizah; Gylfason, Kristinn B.; Haraldsson, Tommy; Wijngaart, Wouter van der; Platt, Geoff; Volkovoy, Vladimir; Swann, Marcus; Rosenfeld, L.; Beyer, Kirsten; Metton, Isabelle; Skorski, Gilbert" Photonic sensing of food allergy : integration and miniaturization Smart Systems Integration, Zurich, Switzerland, March 21.-22., 2012 2012

14. "Fischer, Andreas C.; Bleiker, Simon J.; Somjit, Nutapon; Haraldsson, Tommy; Roxhed, Niclas; Stemme, G"ran; Niklaus, Frank" high aspect ratio tsvs fabricated by magnetic self-assembly of gold-coated nickel wires 62nd Electronic Components and Technology Conference (ECTC), May 29 - June 1, 2012, San Diego, CA 2012


16. "Xu, Cheng; Yveborg, Moa; Chen, Han; Danielsson, Mats; Karlsson, Staffan; Svensson, C.; Bornefalk, Hans" Evaluation of an ultra-fast photon-counting energy-resolved ASIC for spectral CT "Medical Imaging 2012: Physics of Medical Imaging; San Diego, CA;5 February 2012 through 8 February 2012" 2012


18. "Feng, Yi; Xie, Li; Mueller, Maik; Lopez Cabezus, Ana; Mantysalo, Matti; Forsberg, Fredrik; Chen, Qiang; Zheng, Li-Rong; Zapka, Werner"
Fabrication and performance evaluation of ultralow-cost inkjet-printed chipless RFID tags Proceeding of LOPE-C 2012


21. "Dentoni Litta, Eugenio; Hellstr"m, Per-Erik; Henkel, Christoph; T"nstling, Mikael" In situ SiO x interfacial layer formation for scaled ALD high-k/metal gate stacks "2012 13th International Conference on Ultimate Integration on Silicon, ULIS 2012; Grenoble; 6 March 2012 through 7 March 2012" 2012

22. "Smith, Anderson D.; Vaziri, Sam; Delin, Anna; T"nstling, Mikael; Lemme, Max C." Strain engineering in suspended graphene devices for pressure sensor applications "2012 13th International Conference on Ultimate Integration on Silicon, ULIS 2012; Grenoble; 6 March 2012 through 7 March 2012" 2012


27. "Niklaus, Frank; Lapisa, Martin; Bleiker, Simon; Dubois, Valentin; Roxhed, Niclas; Fischer, Andreas; Forsberg, Fredrik; Stemme, Grahn; Grogg, D.; Despont, M." Wafer-level heterogeneous 3D integration
for MEMS and NEMS  "3rd IEEE International Workshop on Low Temperature Bonding for 3D Integration, LTB-3D 2012; Tokyo; 22 May 2012 through 23 May 2012" 2012

28.  "Karlsson, J. Mikael; Carlborg, Fredrik; Saharil, Farizah; Forsberg, Fredrik; Niklaus, Frank; van der Wijngaart, Wouter; Haraldsson, Tommy" High-Resolution Micropatterning of Off- Stoichiometric Thiol- enes (OSTE) Via a Novel Lithography Mechanism  The 16th International Conference on Miniaturized Systems for Chemistry and Life Sciences October 28 - November 1 2012, Okinawa, Japan 2012


34.  "Naiini, Maziar M.; Henkel, Christoph; Malm, Gunnar B.; T"stling, Mikael" Double slot high-k waveguide grating couplers for silicon photonics  70th Device Research Conference, DRC 2012, 18 June 2012 through 20 June 2012, University Park, PA 2012

35.  "Lemme, Max C.; Vaziri, Sam; Smith, Anderson D.; Li, Jiantong; Rodriguez, Saul; Rusu, Ana; T"stling, Mikael" Graphene for More Moore and More Than Moore applications  2012 17th IEEE Silicon Nanoelectronics Workshop, SNW 2012, 10 June 2012 through 11 June 2012, Honolulu, HI 2012

36.  "Fischer, Andreas C.; Gylfason, Kristinn B.; Belova, Lyubov M.; Malm, Gunnar B.; Radamson, Henry H.; Kolahdouz, M.; Rikers, Y. G. M.; Stemme, G"ran; Niklaus, Frank" Layer-by-layer 3D printing of Si
micro- and nanostructures by Si deposition, ion implantation and selective Si etching


40. "Wosinski, Lech; Wang, Zhechao; Lou, Fei; Dai, Daoxin; Thyl,n, Lars" Novel plasmonic waveguides and devices The 5th International Photonics and Optoelectronics Meetings (POEM 2012), November 1-2, 2012 Wuhan, China 2012

41. "Lou, Fei; Wang, Zhechao; Dai, Daoxin; Thyl,n, Lars; Wosinski, Lech" A sub-wavelength microdisk based on hybrid plasmonic waveguides The 5th International Photonics and Optoelectronics Meetings (POEM 2012), November 1-2, 2012 Wuhan, China 2012

42. "Wosinski, Lech; Wang, Zhechao; Lou, Fei; Dai, Daoxin; Thyl,n, Lars" Silicon- and plasmonics-based nanophotonics for telecom and interconnects Asia Communications and Photonics Conference (ACP), 7-10 November, 2012, Guangzhou, China. 2012

43. "Thilmann, Nicky; Stoepppler, Georg; Eichhorn, Marc; Pasiskevicius, Valdas; Zukauskas, Andrius; Canalias, Carlota" ZnGeP2 RISTRA OPO in the mid-IR Region Pumped by a Periodically Poled KTiOPO4 Master-Oscillator Power Amplifier Europhoton 2012 2012

44. "Lou, Fei; Wang, Zhechao; Dai, Daoxin; Thyl,n, Lars; Wosinski, Lech" Photonic devices based on silicon hybrid plasmonic waveguides Asia Communications and Photonics Conference (ACP), 7-10 November, 2012, Guangzhou, China 2012

45. "Guan, Xiaowei; Chen, Pengxin; Wang, Xiaokun; Wosinski, Lech; Shi, Yaochong; Dai, Daoxin" Ultrasmall Directional Coupler and Disk-resonantor Based on Nano-scale Silicon Hybrid Plasmonic Waveguides
46. "Zukauskas, Andrius; Pasiskevicius, Valdas; Laurell, Fredrik; Canalias, Carlota"  Self-assembled ferroelectric nano-domain gratings in bulk RKTP  "2012 Conference on Lasers and Electro-Optics, CLEO 2012; San Jose, CA; 6 May 2012 through 11 May 2012" 2012


49. "Jang, Hoon; Strömqvist, Gustav; Pasiskevicius, Valdas; Canalias, Carlota; Laurell, Fredrik" Control of forward stimulated polariton scattering in periodically poled nonlinear crystals  2012 Conference on Lasers and Electro-Optics, CLEO 2012, 6 May 2012 through 11 May 2012, San Jose, CA 2012


transfer printing for MR-VCSELs on silicon

55. Sugunan, Abhilash Fabrication and Photoelectrochemical Applications of II-VI Semiconductor Nanomaterials Doktorsavhandling, sammanl.,ggning 2012

56. Wang, Xiaodi Dual-ion Conducting Nanocomposite for Low Temperature Solid Oxide Fuel Cell Doktorsavhandling, sammanl.,ggning 2012

57. Ma, Ying Ceria-based Nanostructured Materials for Low-Temperature Solid Oxide Fuel Cells Doktorsavhandling, sammanl.,ggning 2012

58. Ye, Fei Chemically Synthesized Nano-Structured Materials for Biomedical and Photonic Applications Doktorsavhandling, sammanl.,ggning 2012

59. Yar, Mazher Ahmed Development of Nanostructured Tungsten Based Composites for Energy Applications Doktorsavhandling, sammanl.,ggning 2012

60. Bruhn, Benjamin Fabrication and Characterization of Single luminescing quantum dots from 1D silicon nanostructures Doktorsavhandling, sammanl.,ggning 2012


62. Mohseni Armaki, Seyed Majid Spin valves and spin-torque oscillators with perpendicular magnetic anisotropy Doktorsavhandling, sammanl.,ggning 2012

63. Fischer, Andreas C. Integration and Fabrication Techniques for 3D Micro- and Nanodevices Doktorsavhandling, sammanl.,ggning 2012

64. "Oberhammer, Joachim; Somjit, Nutapong; Shah, Umer; Baghchehsaraei, Zargham" RF MEMS for Automotive and Radar Applications: MEMS for Automotive and Radar Applications MEMS for Automotive and Radar Applications: RF MEMS for Automotive and Radar Applications Kapitel i bok, del av antologi 2012

65. "Radamson, Henry; Kolahdouz, M." Group IV materials for low cost and high performance bolometers Bolometers Kapitel i bok, del av antologi 2012

66. "Das, Prabir Kumar; Jelagin, Denis; Birgisson, Bj"rn; Kringos, Nicole" Atomic Force Microscopy to Characterize the Healing Potential of Asphalitic Materials Atomic Force Microscopy - Imaging, Measuring and Manipulating Surfaces at the Atomic Scale Kapitel i bok, del av antologi 2012
67. Lanni, Luigia  
Silicon Carbide Bipolar Integrated Circuits for High Temperature Applications  
Licentiatavhandling, sammanlggning 2012

68. Das, Prabir Kumar  
Thermally Induced Fracture Performance of Asphalt Mixtures  
Licentiatavhandling, sammanlggning 2012

69. "Fischer, Andreas C.; Niklaus, Frank; Stemme, G"ran"  
METHOD AND AN APPARATUS FOR FORMING ELECTRICALLY CONDUCTIVE VIAS IN A SUBSTRATE, AN AUTOMATED ROBOT-BASED MANUFACTURING SYSTEM, A COMPONENT COMPRISING A SUBSTRATE WITH VIA HOLES, AND AN INTERPOSER DEVICE  
Patent 2012