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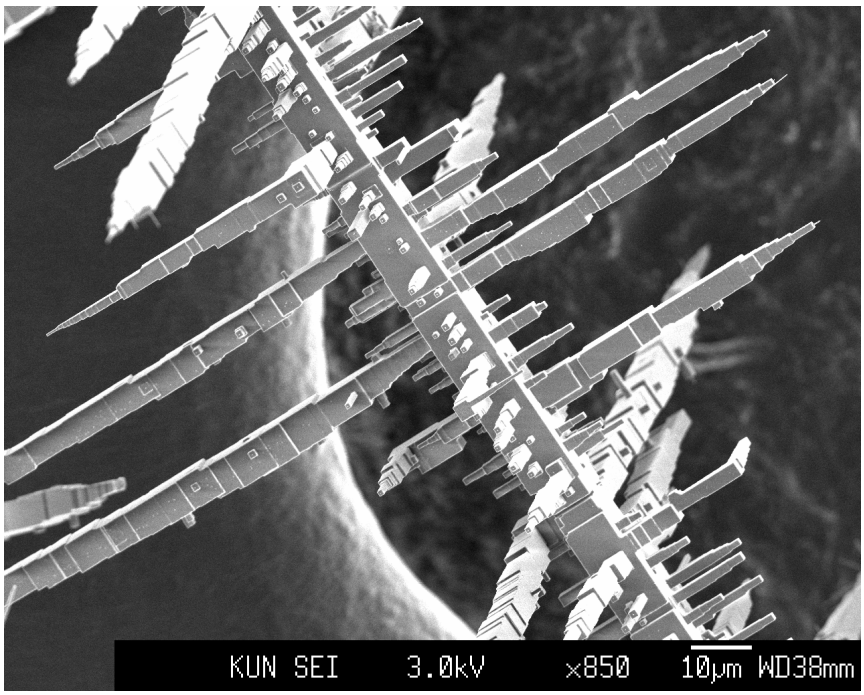

FACET
informatieblad van
de NVKG, sectie van
de KNCV en de NNV

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Omslagfoto/Cover

Kristallen van keukenzout via de gasfase gegroeid. Deze foto, gemaakt door Wim Noorduin en Sander Graswinckel van IMM Vaste Stof Chemie, Radboud Universiteit Nijmegen, was winnaar van de foto competitie bij de BACG/DACG bijeenkomst in Edinburgh, September 2006.

Electronische verzending FA*C*ET

Indien U deze FACET niet via de reguliere mailing aan de NVKG-leden heeft ontvangen, vragen wij U om aan de redactie van de FA*C*ET een geldig emailadres door te geven, danwel kenbaar te maken of U de FA*C*ET in papieren vorm wilt blijven ontvangen.
De FA*C*ET verschijnt uiteraard ook nog altijd gelijktijdig met de emailversie op de website van de NVKG. De meest recente FA*C*ET kan daar te allen tijde uit het FA*C*ETtenarchief gedownload worden. Net zoals de vorige elektronische FA*C*ETten, bevat ook dit exemplaar weer handige, automatische links voor web en e-mail.

Redactioneel

Voor u ligt de eerste FA*C*ET van het jaar 2007. Na het drukke jaar 2006 zijn er ook in 2007 weer diverse kristalgroeiactiviteiten gepland. Het voorjaarssymposium van de NVKG (zie verderop in deze FA*C*ET) zal medio juni gehouden worden aan de Universiteit Leiden. Daarna zal in Augustus de International Conference on Crystal Growth (ICCG-15) plaatsvinden, voorafgegaan door een summer school over kristalgroei en uiteindelijk zal het jaar afgesloten worden met de NVKG jaarvergadering die in november zal plaatsvinden bij Avantium. Het bestuur en de redactie van de NVKG hoopt U wellicht binnenkort bij een van deze gelegenheden te kunnen begroeten.

Een vast item op deze plek is de oproep voor input voor de FA*C*ET. Wat kunt u bijdragen ?

- Aankondigingen van lezingen, symposia en congressen (niet alleen de activiteiten die u zelf organiseert, maar ook activiteiten waarover u langs andere weg bent geïnformeerd)
- Verslagen van (kristalgroei)-conferenties
- Artikelen (mag ook heel kort zijn!) over een opmerkelijke ontdekking
- Advertenties: bijvoorbeeld i.v.m. vacature
- Omslagfoto's (met toelichting). Telkens zal de beste ingezonden foto op de omslag van de FA*C*ET worden afgedrukt samen met een korte toelichting aan de binnenzijde van het blad. Bovendien zullen de foto's op de fotogalerij van onze webstek worden gepost.

De drempel voor uw bijdragen is *zeer laag*: aanleveren kan per brief, fax, e-mail, of telefoon. En we staan natuurlijk open voor alle direct of indirect met de NVKG verwante onderwerpen. De volgende FA*C*ET verschijnt volgens schema eind oktober 2007.

Raoul van Gastel

NVKG Kristalgroeisymposium 2007

***When**:*

Friday, June 15, 2007

***Where**:*

University of Leiden, Lorentz Center (room to be announced: either HL 201 or Gratamazaal)

Traveling:

http://www.lorentzcenter.nl/howto.php

***Registration**:*

Via the webpage of the NVKG, Deadline: June 4, 2007 due to catering

***Papers**:*

Participants are asked to submit an oral contribution including an abstract (max. 1/2 A4) to rost@physics.leidenuniv.nl subject: NVKG paper submission
Deadline: June 4, 2007

Preliminary Program:

The final program will be published on the NVKG webpage. It also will be send by Email to the registered participants.

10:00	coffee / tea	
10:30	Welcome	Dr. Marcel Rost UL
10:40	paper to be announced	
11:00	paper to be announced	
11:20	paper to be announced	
11:40	paper to be announced	
12:00	Lunch	
13:00	paper to be announced	
13:20	paper to be announced	
13:40	paper to be announced	
14:00	paper to be announced	
14:20	paper to be announced	
14:40	coffee / tea	
15:00	Lab tour	
16:00	Reception / Closure	

NVKG Kristalgroeiprijs 2007

Dit jaar zal opnieuw de twee-jaarlijkse NVKG prijs voor kristalgroei, bestaande uit een oorkonde en een geldbedrag van € 1000,- worden toegekend aan een jonge onderzoeker voor hoogstaand wetenschappelijk onderzoek op het gebied van de kristalgroei. De prijs is bedoeld voor de auteur van het beste proefschrift of van een daarmee gelijkwaardige serie wetenschappelijke publicaties (bijvoorbeeld opgesteld in een industriële context). Het proefschrift dient na 1 januari 2005 met succes te zijn verdedigd aan een Nederlandse universiteit. Voor de toekenning van de prijs komen Nederlanders in aanmerking en niet-Nederlanders die hun onderzoek in Nederland hebben verricht.

De kandidaat, met een leeftijd van maximaal 35 jaar tijdens de uitreiking, moet hebben getoond te beschikken over grote bekwaamheden als onderzoeker alsmede over wetenschappelijke originaliteit en productiviteit. Bovendien moet de kandidaat een goed inzicht hebben in de problemen op het vakgebied van de kristalgroei. De toekenning van de prijs geschiedt door het bestuur van de NVKG op basis van een aanbeveling door een selectiecommissie van drie deskundigen. De uitreiking van de prijs zal plaatsvinden tijdens de NVKG jaarvergadering, die 16 november 2007 gehouden zal worden bij Avantium.

Het bestuur van de NVKG geeft aan iedereen de gelegenheid om geschikte kandidaten schriftelijk voor te dragen. Een voordracht, met daarin de naam van de kandidaat, een korte argumentatie waarom de betrokkene in aanmerking komt, een kort curriculum vitae en drie exemplaren van het proefschrift of de serie van publicaties, dient **uiterlijk 30 september 2007** toegezonden te worden aan de voorzitter van de selectiecommissie: Dr. R.M. Geertman, API-PD, Organon N.V. Posbus 20, 5340 BH Oss, email: rob.geertman@organon.com

De kandidaatstelling dient vertrouwelijk te worden behandeld.

CONFERENCE RELATED INFORMATION

TRANSPORTATION

Salt Lake City has an international airport and is a hub of Delta Airlines. Thus, frequent flights are available from all US cities and some direct flights from international cities are also available. The conference site, the Grand America Hotel, is a short (15 min, $20) taxi ride from the Salt Lake International Airport.

For those needing Visas for travel to the US, please contact the conference Secretariat, Tom Surek, who will provide letters of invitation.

PLEASE ASK FOR THESE LETTERS WELL IN ADVANCE OF THE MEETING.

FACILITIES AND ACCOMMODATIONS

Conference functions including the technical sessions, poster displays and industrial exhibits will be held at the facilities of the Grand America Hotel in Salt Lake City, Utah. A block of rooms has been reserved at a special conference rate. Please see the conference website for more information. Housing Reservations are due by June 1, 2007.

SOCIAL EVENTS

The meeting will begin with a welcoming social on Sunday evening at the Grand America Hotel with entertainment by a western band.

An extensive program for accompanying persons will include trips to the well-known ski areas, Antelope Island in the Great Salt Lake, shopping excursions to the exclusive new shopping areas in downtown Salt Lake City, and a reconstructed pioneer village. Plans are to also visit a rehearsal of the world-famous Mormon Tabernacle Choir.

Several excursions are being planned for the free afternoon of the conference including a tram ride at world-famous Snowbird ski resort, hiking and shopping at the old mountain mining town of Park City, followed by a dinner at Pioneer Village.

Pre and Post conference tours to such attractions as Yellowstone National Park, the Grand Canyon, Bryce Canyon, the Arches or Zions National Park can be arranged using the services of Western Leisure. Their web address is www.westernleisure.com and they can be contacted directly by e-mail at info@westernleisure.com. Please make sure to mention the ICCG conference in making these arrangements since a minimum number of participants will be needed. For more information, contact Edith Bourret-Courchesne, Lawrence Berkeley National Laboratory, Edbourret@lbl.gov

INDUSTRIAL EXHIBITS

An extensive exhibit of apparatus, materials, and services of interest to the crystal growth community will be in rooms close to the technical sessions. This will also be the site of coffee breaks. For further information and vendors interested in contracting space please contact: Gordon Banish, Cyberstar, CyberstarAmerica@aol.com

AWARDS

The Laudise, Frank and Scheiber Prizes will be awarded through the auspices of the International Organization of Crystal Growth, Robert Sekerka, President.
For further details see their website at http://www.iocg.org

CALL FOR ABSTRACTS

In addition to invited papers, contributed papers, in English only, will be accepted on all aspects of crystal growth. They must contain new material not previously published. While authors may request a poster or an oral presentation, the program committee will set the program schedule based on conference requirements.

Important Dates:
Abstract Submission begins - **January 1, 2007**
Abstract Submissions end - **March 15, 2007**
Abstract Acceptance Notification - **April 15, 2007**
Late News Poster Submissions - **May 15, 2007**
For further information contact the designated program chairs.
Robert Biefeld, Sandia National Laboratories, rmbiefe@sandia.gov
or **Jeffrey Derby**, University of Minnesota, derby@umn.edu

PUBLICATION OF PROCEEDINGS

The proceedings of the ICCG-15 and OMVPE-13 will be published as a special issue of the Journal of Crystal Growth. All attendees are invited to submit an original manuscript on their work. The details of the submission process will be posted on the conference website.

REGISTRATION INFORMATION

CONFERENCE REGISTRATION

You may register in one of 3 ways:
1) on line at **http://www.crystalgrowth.us/iccg15/index.php** (prior to August 10),
2) by mail addressed to (must be received prior to August 4, 2007) :
ICCG-15
c/o AACG Headquarters
25 Fourth St.
Somerville NJ USA 08876
3) in person at the registration desk during the conference
(see conference schedule for hours of operation).

Registration Fees:
All funds are US $ drawn on a US bank, use of credit cards is encouraged. Fax number for credit card payments: (908) 575-0794.

1) Early registration (must be received prior to July 1, 2007):
a) Regular attendee.....$ 585.
b) Full time student.....$ 200.

2) Late registration (received after July 1, 2007):
a) Regular attendee.....$ 685.
b) Full time student.....$ 300.
c) Single day registration.....$ 200.

3) We ask that spouses register; attendance at the welcome reception, and access to a 'Spouses' room where coffee and light snacks will be provided during the conference breaks are included with a spouses registration. Any spouse wishing to attend the banquet must also purchase a separate banquet ticket.
a) Spouse's registration.....$ 25.
b) Additional banquet tickets.....$ 75.

4) Each regular registration includes: one copy of the proceedings, one ticket to the banquet dinner. Student or single day registrations include neither of these benefits.
a) Extra copies of the proceedings.....$ 75.
b) Additional banquet tickets.....$ 75.

5) In exchange for a greatly reduced registration fee, we ask each student to contribute 4 hours of their time toward completing tasks such as: A/V assistance during oral sessions, logistical support prior to the conference, or assistance at the registration desk.

6) Each company participating in the industrial exhibition is entitled to a regular registration for a single representative. Additional representatives of an exhibiting company who wish to attend the technical sessions or the banquet will need to register in the normal manner.

Cancellations:
Cancellation requests must be received via mail at the address above, or e-mail to aacg@att.net by Friday, August 4, 2007. Refunds (less $50. processing fee) will be made by return mail after the conference ends. Other special cases:
1) Any waived fees, or other financial assistance must be arranged prior July 1, 2007. Please contact the financial aid chairpersons directly.
2) Letters of invitation can be obtained by contacting the conference secretariat Tom Surek at tom_surek@nrel.gov. It is the responsibility of each attendee to allow enough time to obtain the necessary visa from their local US consulate if one is required.

FINANCIAL ASSISTANCE

The conference has a very limited budget to aid attendees in need of financial assistance. This aid may come in the form of: 1) reduced or waived registration fees, 2) assistance with hotel expenses while attending the conference, or 3) assistance with travel expenses. All financial aid (including any offered to invited or plenary speakers) must be approved by the financial aid committee prior to July 1, 2007.

All requests for assistance should be e-mailed to **dave.vanderwater@philips.com** prior to the July 1, 2007 deadline. Recipients of financial aid awards will be notified as quickly as is possible.

INTERNATIONAL ADVISORS

Horia Alexandru, Romania
Peter Capper, United Kingdom
Chuangtian Chen, China
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Ernesto Dieguez, Spain
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Michael Schieber, Israel
Robert Sekerka, USA
Darrell Schlom, USA
Koichiro Takahashi, Japan
Jan Van der Eerden, The Netherlands
Simon Watkins, Canada
Evgeni Zharikov, Russia

OMVPE-13 (August 12-16, 2007)

This workshop continues a tradition first started in Cornell in 1983, bringing together specialists in organometallic vapor phase epitaxy from industry, academia and government laboratories in an informal atmosphere and scenic surroundings. The OMVPE workshop is an excellent opportunity to present and discuss new results and provides a venue for recent entrants in the field to familiarize themselves with the latest OMVPE science and technology. Since 2003, the OMVPE workshop has been held in conjunction with the ACCGE conference to provide a format that maximizes interaction among OMVPE specialists within the context of the wider crystal growth community.

Topics will include, but are not limited to:
- OMVPE growth of novel nanostructures and materials
- III/V nitrides and other wide bandgap materials
- III/V phosphides, arsenides and atimonides
- Quantum dots, nanowires and other nanocrystals
- Selective and non-planar growth
- OMVPE materials science
- OMVPE surface and reaction chemistry
- Simulation and modeling of growth processes
- Doping issues in III/V materials
- Relationship between epitaxy and device physics
- Production and process safety issues
- Role of OMVPE in emerging markets for epitaxial materials

OMVPE Workshop Organizing Committee: Raj Bhat (Corning Inc.), Robert Biefeld (Sandia National Labs), John Geisz (NREL), Robert Hicks (UCLA), Daniel Law (Spectrolab), Joan Redwing (Penn State Univ.), Mike Tischler (Ocsis Technology), Christine Wang (MIT Lincoln Laboratory), Simon Watkins (Simon Fraser Univ.)

SUMMER SCHOOL

The 13th International Summer School on Crystal Growth will be held August 5-11, 2007 at the Park City Marriott in Park City, Utah. In following tradition, the School will be held the week prior to the 15th International Conference on Crystal Growth in Salt Lake City, Utah.

For further information contact:
Christine Wang, wang@ll.mit.edu, or
Jim DeYoreo, deyoreo1@llnl.gov.

Conference website:
http://www.crystalgrowth.us/iccg15/index.php

15th International Conference on Crystal Growth

held in conjunction with the

13th International Conference on Vapor Growth and Epitaxy

and the

13th Biennial Workshop on Organometallic Vapor Phase Epitaxy

Chairs: G. B. Stringfellow, University of Utah
R.S. Feigelson, Stanford University

August 12-17, 2007 Salt Lake City, Utah

Sponsored by the American Association for Crystal Growth
Contact: aacg@att.net

ORGANIZING COMMITTEE

ICCG-15 and ICVGE-13 Conference Chairs
Gerald Stringfellow, University of Utah and Robert S. Feigelson, Stanford University

OMVPE-13 Chair
Joan Redwing, Pennsylvania State University, jmr31@psu.edu

Program Chairs
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Industrial Exhibit
Gordon Banish, Cyberstar, CyberstarAmerica@aol.com

Photo Contest
Glen Kowach City College of New York, kowach@sci.ccny.cuny.edu

Financial Assistance
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Website Management
Becky Torrisi

ABOUT THE ICCG CONFERENCES

The purpose of the International Conferences on Crystal Growth is to bring together scientists and engineers from around the world to discuss current activities in bulk and thin film crystallization theory, crystal growth and characterization. While listening to presentations is the foundation of all conferences, it is the personal interactions with colleagues during the conference that provides a most important way to examine the technical and professional issues of importance to the field. These also help to stimulate the review of historical theories and practices and to test new ideas in an informal setting. A vendor exhibit will allow participants to interact with various manufacturers of equipment for the growth and characterization of bulk crystals and thin films, materials suppliers and book publishers.

Crystal growth is a broad field that attracts people from a wide variety of disciplines. It includes the fundamentals of bulk and thin film growth, computer modeling, the growth and characterization of electronic, optical, magnetic, organic and biological materials and the application of new characterization technologies, etc. These conferences feature symposia on important new topics in crystal growth and also more traditional subjects of continuing interest. These provide researchers with an opportunity to develop an understanding of the background, current directions and future opportunities in these fields. Current interest in nano-science and technology and bioengineering has provided the crystal growth field with many new opportunities and challenges for materials preparation and device research. These new fields will be explored during ICCG-15.

SCOPE OF ICCG-15/ICVGE-13 (AUGUST 12-17, 2007)

ICCG 15 will be held together with the International Conference on Vapor Growth and Epitaxy (ICVGE 13) and the 13th U.S. Biennial OMVPE Workshop in beautiful Salt Lake City, Utah. The conference site will be the Grand America Hotel built for the Winter Olympics in 2002. It is a five star hotel with exceptional meeting facilities and other amenities that will help make the stay of the attendees both comfortable and convenient. These conferences will provide a forum for the presentation and discussion of recent research and development activities in all aspects of bulk crystal growth and epitaxial thin film growth, with sessions integrating fundamentals, experimental and industrial growth processes, characterization and applications. In addition to the focused sessions listed below, other sessions may be organized based upon the topical distribution of contributed papers. The conference language as usual will be in English and will include both oral and poster sessions, as well as plenary and invited speakers to provide a broad picture of developments in the field. The meeting will focus on a wide range of crystal science issues. For updates, additional information and registration please check the conference website **http://www.crystalgrowth.us/iccg15/index.php**

PLENARY LECTURERS

- **Greg Olsen**, GHO Ventures; "The Crystal Grower in Space".
- **Lars Samuelson**, Lund University, Sweden;
  "Formation of 1D Quantum Structures via Guided Self-Assembly".
- **George Craford**, Philips-Lumileds;
  "High Power LEDs: Technology Trends, Applications, and Solid State Lighting".
- **Peter Rudolph**, Institute of Crystal Growth, Max-Born, Germany;
  "Translating Magnetic Fields Applied to Bulk Growth from Melt: The Step from Basic Research to Industrial Scale".
- **Takatomo Sasaki**, Professor, Osaka University, Japan;
  "New developments in crystal growth from solution: oxide, protein and nitride"
- **Jim DeYoreo**, Lawrence Livermore National Laboratories;
  " Investigating Biomolecular Controls over Templated Nucleation and Growth of Crystals"

TECHNICAL SESSIONS, SESSION ORGANIZERS AND INVITED SPEAKERS TO DATE

Fundamentals of Crystal Growth: Theory and Experiment - Robert Sekerka, Carnegie Mellon Univ., USA, PeterVekilov, Univ. of Houston, USA
Sessions will cover theory, modeling, and experiments designed to learn or test fundamental aspects of crystal growth at all length scales. Emphasis will be placed on methodologies such as phase field theories and those that exploit the mesoscopic scale and serve to join phenomena on the atomic and macroscopic levels.

Bulk Crystal Growth - Jochen Friedrich, Kristallzuchtung Fraunhofer Institute, Germany and Aleksandar Ostrogorsky, Rensselaer Polytechnical Institute, USA
The science and technology of bulk crystal growth of semiconductors, oxides and halides will be covered with a focus on improvement of industrial crystal growth processes with respect to higher yield and defect control. Both experimental and modeling strategies will be discussed in order to address the current and future challenges in the area of bulk crystal growth.
Invited Speakers: Stephan Eichler, Freiberger Compound Materials, Germany; Robert Feigelson, Stanford Univ..

Thin Film Growth and Epitaxy - Tadashi Ohachi, Doshisha Univ., Japan and Thomas Kuech, Univ. of Wisconsin- Madison, USA
All aspects of the chemical, physical and technology of the formation of thin films will be covered from the epitaxial point of view. This includes development and evolution of specific morphologies and micro- to nanostructure of the films, theoretical and experimental aspects of thin film growth, and applications to novel devices and new materials properties.
Invited Speaker: Akinori Koukitu, Tokyo Univ. of Agriculture & Technology, Japan

Oxide, Halides and Crystals for Radiation Detection - Edith Bourret-Courchesne, Lawrence Berkeley National laboratories, USA and William M. Higgins, Radiation Monitoring Devices, Inc. USA
This session brings together researchers involved in the crystal growth of a variety of crystals (oxides, halides, chalcogenides and semiconductors) with a major focus on materials for radiation detectors (alpha particles, neutrons and gamma rays) as well as deep UV to Far IR optical windows, etc. Topics to be covered include purification, growth, characterization, processing and device applications from both a theoretical and experimental perspective.

Crystal Growth Under Applied External Fields - David Bliss, Air Force Research Lab, USA and Thierry Duffar, CNRS Grenoble, France.
This session will focus on novel crystal growth methods utilizing magnetic, electric, sonic, or other externally applied fields. Such mechanisms may be used to control crystal stoichiometry and doping uniformity, or to reduce defect density. Contributions from researchers in the field of bulk and/or epitaxial growth using externally applied fields are welcome. Investigations of the underlying mechanisms and modeling of EM field interactions with condensed matter may also be presented.

Surfaces and Interfaces: Surfaces and Interfaces of Bulk and Epitaxial Processes - William Goodhue, Univ. of Massachusetts, USA.
Papers are solicited on the structural, mechanical and electrical properties of surfaces and interfaces formed during bulk growth, wafer polishing and epitaxial growth. The goal of the session is to bring bulk and epi growers together with fabricators and theoreticians to discuss the physics of interfaces and surfaces formed in a variety of material systems with the aim finding new pathways for producing better materials and structures for device applications.
Invited Speaker: Michael Weimer, Texas A&M , USA

In Situ Measurements and Characterization of Crystal Growth - Candace Lynch, Air Force Research Lab (SNHC), USA and Elias Vlieg, Radboud University, The Netherlands.
In situ characterization during crystal growth allows real-time monitoring of the growth process and has the potential for probing fundamental behaviors not accessible via ex situ analysis. The application of in situ monitoring to all aspects of crystal growth and materials systems is of interest for this session. Topical areas include, but are not limited to, the use of wafer curvature measurement, AFM, STM, TEM, RHEED, SEM, and X-ray diffraction during crystal growth.
Invited speakers: Cody Friesen, Arizona State Univ., USA

Correlated Electron Materials - David Mandrus, Oak Ridge National Lab, USA and Cedomir Petrovic, Brookhaven National Lab, USA
This topic will concentrate on design, crystal growth and characterization of physical properties of materials that exhibit strong electronic correlations. Materials of interest include intermetallics (heavy fermions and rare earth compounds, borides, carbides…), oxides (high TC superconductors, manganites, ruthenites, pyrochlores, low dimensional and frustrated magnetic systems…), chalcogenides, fluorides, chlorides, etc. The session will bring together members of the inorganic synthesis and neutron scattering communities as well as theorists in order to foster an exchange of ideas that will further develop the science of correlated electron crystals.

Crystal Growth of Laser and Nonlinear Optical Materials - Peter Schunemann, BAE Systems, USA
This section will focus on issues surrounding the growth, properties, processing, and device performance of laser host and nonlinear optical materials. Topics include, but are not limited to, crystal growth methods, characterization and elimination of defects, enhancements in size, properties and performance, fabrication techniques, and new materials. Papers on both single crystal and polycrystalline laser host materials are welcome, as well both birefringent and quasi-phase-matched nonlinear optical crystals

Growth of Quantum Dots, Wires, and Nanocrystals - Jeffrey Cederberg, Sandia National Labs, USA and Alexana Roshko, NIST, USA
Significant progress has been made in the fundamental scientific understanding of nanostructures. Various forms of crystal growth have been a necessary component of this advancement, providing structures with increasing complexity. In spite of these advances there are unresolved issues related to the control of nanostructure size, shape and positioning, as well as the influence of growth parameters on properties. The aim of this session is to bring together researchers studying quantum dots, wires, and nanocrystals to discuss both synthesis and characterization of nanostructures, as well as theoretical modeling.
Invited Speakers: Jerry Tersoff, IBM (TJ Watson Research Center), USA and Art Nozik, NREL, USA

Wide Bandgap Bulk and Epitaxial Growth (GaN, SiC, ZnO, Etc.) - Andrew Allerman, Sandia National Labs, USA and Marek Skowronski, Carnegie Mellon Univ., USA
This session will cover all aspects of growth of this class of materials including but not limited to gallium, aluminum, and indium nitride and their alloys, cubic and hexagonal silicon carbide, and zinc oxide. Separate sessions will cover bulk growth, homo-, and hetero-epitaxy.
Invited Speakers: Jung Han, Yale University, USA and Joseph Sumakeris, Cree, USA

Growth of Magnetic Semiconductors for Spintronics - Nitin Samarth, Pennsylvania State University, USA
Papers are solicited on recent advances in the crystal growth, characterization, fabrication and modeling of magnetic semiconductor materials for spintronics, including bulk crystals, heterostructures and nanostructures. Materials of interest include transition metal doped III-V, II-VI and group IV semiconductors, as well as transition metal oxides.

Crystal Growth of Narrow Gap Materials - Simon Watkins, Simon Fraser Univ., Canada
This session will focus on the growth and applications of narrow gap semiconductor materials in both bulk and epitaxial form. Examples include antimonides, bismides, II-V compounds such as HgCdTe and other narrow gap semiconductor materials. Papers are requested relating to device applications such as long wavelength lasers, light emitting diodes, long wavelength photodetectors, Hall sensors, high speed narrow gap electronic devices such as FETs and HBTs, and other device applications.

Functional Oxides : Epitaxial Thin Films and Multilayers - Darrell G. Schlom, Pennsylvania State University, USA and Stephen K. Streiffer, Argonne National Laboratory, USA
The exceptional properties of functional and multifunctional oxides, combined with the inability of simpler materials to meet the increasing demands of integrated technologies, have motivated tremendous interest and activity in the synthesis of such films for electronic, magnetic, optical, and chemical applications. This session focuses on issues in film synthesis and the resulting structure and properties of epitaxial functional and multifunctional oxide thin films, and on how growth can be used to tailor magnetic, magneto-resistive, optical, catalytic, dielectric, ferroelectric, superconducting, etc., behavior.

Novel Materials - Glen Kowach, City College of New York, USA and Christian Kloc, Lucent Technology, USA.
We are seeking papers in the area of novel materials (organic semiconductors, boride/carbide superconductors, hydrogen storage materials, detector materials, porous materials, among others) and in novel crystal growth techniques (high pressure crystal growth, hydrothermal and solvothermal methods, metal fluxes, among others).
Invited Speaker: Dr. G. Behr, Leibniz Institute for Solid State and Materials Research, Dresden, Germany

Growth of Crystalline Silicon and Other Photovoltaic Materials - Tom Surek, NREL, USA
The rapid growth in photovoltaic markets has been the direct result of advances made in crystal growth technologies – from crystalline silicon to thin-film materials to high-efficiency III-V multijunction solar cells for concentrators. This session will feature the latest progress in these technologies and the research issues being addressed.
Invited Speaker: Mark Wanlass, NREL, USA and Emanuel Sachs, MIT, USA

Advanced Characterization of Defects - Susan Babcock, Univ. of Wisconsin, USA and Linda Romano, Lumileds-Philips, USA
This session will focus on techniques for characterization of isolated defects and microstructures in bulk crystals and thin films. Highlights on novel techniques and applications of existing techniques to characterize defect structure, defect properties, and defect-based mechanisms are encouraged.

Biological Control of Crystallization - Roger Qiu, Lawrence Livermore National Laboratory, USA

Crystal Growth Technology - Hans Scheel, Scheel Consulting, Switzerland and Partha Dutta, Rensselaer Polytechnic Institute, USA
The session will consist of invited lectures on: industrial bulk crystal growth of semiconductors; laser and NLO crystals, detector and substrate crystals etc.; growth equipment including crucibles and atmosphere control; process control and process simulation; crystal machining and wafering; and also contributed oral and poster presentations on these topics.

Recente proefschriften

Dr. Ir. Corine Dam
"Experimental and numerical aspects of GaN growth by HVPE"
Promotor: Prof. Dr. P.K. Larsen
Copromotores: Dr. P.R. Hageman
Radboud Universiteit Nijmegen
Verdedigd op: 24 oktober 2006

Summary
GaN, with its wide bandgap of 3.42 eV and its excelent material properties, is a very interesting material for optical and electronical devices. One of the main limitations at this moment still is the lack of availability of GaN substrates or lattice matched substrates. The growth technique used in the experiments described in this thesis, Hydride Vapour Phase Epitaxy (HVPE), is a promising technique to produce GaN substrates. Because of the high growth rate, thick GaN layers can be grown at reasonable time and reasonable cost. After growth, the thick GaN can be separated from the substrate and free-standing GaN is the result. This thesis is aimed at giving more insight into the HVPE growth process in relation to the grown GaN material, both through experiments and calculations on the flows with Computational Fluid Dynamics (CFD).

In chapter 4 a CFD model including the basic chemistry for GaN growth with HVPE was described. An excellent correspondence was found between the growth rate from the experiments and from the calculations. This indicates that CFD is a very useful tool when studying growth from vapour phase. Data about flows and species distribution, which are not experimentally available, can be calculated. Both the experiments and the CFD calculations show that the HVPE growth technique is very sensitive to small changes to the reactor geometry. A change in the angle of the GaCl inlet allows obtaining a more uniform growth.

The effect of the carrier gas on growth rate and quality of the grown layers is shown in chapter 5. The growth rate is accesible both by the calculations and by the experiments, again there is a good correspondence. For the used reactor geometry the highest growth rate is found for growth under 85% H_2 as the carrier gas. From the CFD calculations two important factors are found to contribute to the flow pattern and deposition rate: buoyancy effects because of concentration differences and the diffusion coefficient. The calculations also show that the position of the area of growth relative to the GaCl inlet is very important in determining the growth rate and distribution.

The choice of starting substrate for HVPE growth is very important. In chapter 6 templates grown by Metal Organic Chemical Vapour Deposition (MOCVD) with the Galium Treatment Step (GTS) are used for growth of thick GaN layer by HVPE. This results in 100-300 μm thick GaN layers that are grown on these template without visible cracks. The influence of the GaN buffer layer grown by MOCVD is investigated by growing 25 μm thick layers with HVPE on 4 different templates with GTS. The deposition time of the GaN buffer layer after GTS treatment in MOCVD was varied. The thickness of the buffer layer does not influence the properties of the subsequently grown GaN layer by HVPE as soon as the growth in MOCVD starts to make the transition from 3D growth to 2D growth. This means that shorter growth times can be applied in MOCVD growth of templates for HVPE as the buffer layer from the MOCVD growth does not need to be fully coalesced.

For growth in MOCVD and Molecular Beam Epitaxy (MBE) adding In to the growth system acts as a surfactant. In chapter 7 the effect of adding In to the growth system of HVPE is studied for H_2 and N_2 as the carrier gasses. For N_2 the effect of adding In is largest: the reduction of the full width half maximum values of the peaks in the PhotoLuminesence (PL) spectra indicate an improvement of the optical quality. For growth under H_2 this effect is not so strongly present. For both carrier gasses the growth rate decreases when In is added, this is probably due to the blocking of growth sites by In, resulting in a slower movement of the steps at the surface and thus a lower growth rate. This slower step movement with In present also allows the removal of

distortions due to pinning of steps by dislocations.

As an addition to our small HVPE reactor for 2" wafers, a new 4" reactor has recently been built in our laboratory. In order to know how to adjust the growth parameters to translate results from the small reactor to the larger reactor CFD calculation have been performed. Both the Grashof number and the Reynolds number need to be kept constant for dynamic similarity. This can easily be obtained by changing the pressure inside the reactor, which effects the density and the diffusion coefficients, and the velocity of the incoming gasses. With the appropriate scaling rules the flow pattern and the dimensionless growth rate do not change in the CFD calculations during the scaling of the reactor. The physical growth rate, however, decreases. This can be compensated by increasing the mass flow of GaCl into the reactor.

In general it can be said that the work presented in this thesis results in a better understanding of the HVPE growth process in a horizontal reactor. The combination of experiments and calculations shows that the used model is a very valuable tool to access data which is not easily accesible experimentally, like the species distribution and flow patterns. Both the experiments and the calculations have given more insight into the important factors of the growth proces, e.g. carrier gas and choise of template. With this increasing understanding of the growth process the easy fabrication of a good quality GaN substrate is getting closer.

Dr. Christina Stoica

"Control of crystal morphology and polymorphism using a model steroid"

Promotor: Prof. Dr. E. Vlieg
Copromotores: Dr. H.L.M. Meekes en Dr. W.J.P. van Enckevort
Radboud Universiteit Nijmegen
Verdedigd op: 4 december 2006

Summary

Control of polymorphism is important for many applications and is especially relevant for the pharmaceutical industry. It was recently discovered that epitaxial nucleation of one polymorph on a specific crystal phase of another form can play a role in the formation and conversion of polymorphs. In this thesis a detailed study is presented on this polymorphic epitaxial nucleation for a steroid called 7αMNa that has two known polymorphic forms.

The influence of a solvent on the morphology of the steroid crystals is treated in chapter 2. The attention is focused on the two opposite {010} faces that, due to their different growth rates when grown from different solvents (like methanol or acetone), determine the polar morphology of the crystals. It is shown that the solvent can hamper or promote the crystallization differently when interacting with two opposite faces. The phenomenon is explained by using results of Molecular Dynamics simulations.

In chapter 3 the epitaxial nucleation of the metastable polymorph of the 7αMNa steroid on the (010) face of the stable form is studied. It is shown that the 2D barrier of epitaxial nucleation is lowered as compared to the 3D barrier for nucleation. It is also shown that the nucleation of the metastable polymorph on the opposite (010) surface occurs at higher supersaturation as compared to the one needed for the nucleation on the (010) surface, or does not occur at all depending on the solvent.

By comparing the solubility of the steroid in two different solvents it was observed that the metastable zone width for epitaxial nucleation is a function of the solubility of the compound in different solvents: the higher the solubility, the lower the threshold observed value for the 2D epitaxial growth of the metastable polymorph. The life-time of the metastable polymorph in solution is also affected by the solubility in different solvents: the higher the solubility, the faster the polymorphic transformation into the stable polymorph.

Chapter 4 deals with the reverse process, that is the epitaxial nucleation of the stable polymorph on a specific face of the metastable polymorph and the complex phenomenon of concomitant polymorphism. It is shown that the 2D barrier for nucleation of the stable polymorph is lowered as compared to that of

3D nucleation, as the stable polymorph is using a specific face (namely the (010) face) of the metastable polymorph as template for crystallization. An important conclusion of this study is that for low supersaturations for the metastable polymorph, Ostwald's rule of stages in 2D does not hold.
By studying the life-time of the metastable polymorph in solution, it is shown that both polymorphs can co-exist (i.e. grow) in solution. A theoretical polymorphic phase diagram is derived and the phenomenon of concomitant polymorphism is explained. Some practical applications of the heterogeneous epitaxial polymorphic nucleation are presented.
The experimental results presented in the first chapters led to the conclusion that the two opposite {010} surfaces of the polymorphs of the 7αMNa steroid, acting as templates for epitaxial polymorphic nucleation, needed to be analysed closely. Therefore, in chapter 5 the (010) face of the stable polymorph is studied in-situ and ex-situ. It is shown that the (010) face and faces with nearly the same orientation are rough faces, unlike the opposite (010) face. It is concluded that the epitaxial nucleation of the metastable polymorph leads to self-poisoning of the (010) face. The conclusion is strengthened by the results of vacuum experiments that show that the crystals of stable form have a polar habit.
In chapter 6 the (010) face of the polar crystals of the stable polymorph is studied ex-situ using various techniques. It is shown that this facegrows via a spiral growth mechanism. No 2D nucleation was observed to occur on this face, even for relatively high supersaturation.
The symmetry induced and the accidental interlacing patterns of the spirals are analysed, also taking in consideration the effect of the solvent, the supersaturation and added impurities (in this case inorganic compounds, i.e. NaI). The thickness of the corresponding growth layers and the step directions of the spirals found experimentally agree well with the crystal structure and the directions of the strongest Periodic Bond Chains.

AANKONDIGING CONGRESSEN EN SYMPOSIA

NVKG Kristalgroeisymposium,
15 juni 2007, Universiteit Leiden, organisator: M. Rost
Zie de aankondiging in deze FACET en de NVKG website….

Summer school "Directed Self-Assembly",
24-29 Juni 2007, d'Amelander Kaap, Hollum, Ameland
Voor details zie http://www.ru.nl/IMM-Amelandschool2007

International Conference on Crystal Growth ICCG 15,
12-17 Augustus 2007, Salt Lake City, Utah, USA
Co-chairs R. Feigelson and G. Stringfellow

International Summer School on Crystal Growth ISSCG 13,
5-10 Augustus 2007, Park City, Utah USA,
Co-chairs J. DeYoreo and C. Wang

NVKG Jaarvergadering,
16 November 2007, Avantium
Nadere details volgen in de volgende FACET.....

ISIC-2008,
14-17 september 2008, Maastricht
Zie de ISIC-17 website (let op abstract deadline 1 oktober 2007 !!!)