



SYMPOSIUM K

Rare Earth Doped Semiconductors III

May 30 – June 2, 2000

Symposium Organizers:

J.M. Zavada, European Research Office, London, UK

T. Gregorkiewicz, University of Amsterdam, The Netherlands

A.J. Steckl, University of Cincinnati, USA

Symposium Support:

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E-MRS 2000 SPRING MEETING

SYMPOSIUM K

Tuesday May 30, 2000

Mardi 30 mai 2000

Morning

Matin

Session I – Opening Session

Chairperson : T. Gregorkiewicz

9:00 **Welcome Remarks**, T. Gregorkiewicz

K-I.1 9:15 **Invited** IMPACT EXCITATION OF RARE EARTHS IONS IN Si HOSTS: MATERIALS ISSUES AND DEVICE PERFORMANCES, **S. Coffa**, S. Libertino, A. La Magna, CNR-IMETEM, Catania, Italy; Ch. Buchal, S. Wang, Forschungszentrum Juelich, Germany

K-I.2 9:45 **Invited** NON-RADIATIVE PROCESSES INVOLVING RE IMPURITIES IN NANOSTRUCTURES, **J. Langer**, Institute of Physics, Polish Academy of Sciences, Poland

10:15 **BREAK**

Session II – Si Nanocrystals

Chairperson : W. Jantsch

K-II.1 10:45 **Invited** STRONG EXCITON-ERBIUM COUPLING IN SI NANOCRYSTAL-DOPED SiO₂, P.G. Kik, M.L. Brongersma and **A. Polman**, FOM Institute for Atomic and Molecular Physics, Kruislaan 407, 1098 SJ Amsterdam, The Netherlands

K-II.2 11:15 INVESTIGATION OF ENERGY EXCHANGE BETWEEN SILICON NANOCRYSTALS AND Er³⁺ IN SILICA, **C.E. Chryssou**, A.J. Kenyon, C.W. Pitt, Department of Electronic and Electrical Engineering, University College London, Torrington Place, London WC1E 7JE, UK

K-II.3 11:35 CONFINEMENT INDUCED ENHANCEMENT OF THE EMISSION IN ER-IMPLANTED Si/SiO₂ QUANTUM WELLS FABRICATED ON SOI SUBSTRATES, **D. Sotta**, V. Calvo, H. Ulmer, N. Magnea, E. Hadji, D. Jalabert, F. Fournel, DRFMC/SP2M CEA-Grenoble, 17 rue des Martyrs, 38054 Grenoble Cedex 9, France and H. Moriceau, B. Aspar, LETI, DMITEC CEA-Grenoble, 17 rue des Martyrs, 38054 Grenoble Cedex 9, France

K-II.4 11:55 MICROSTRUCTURAL ORIGIN OF Er³⁺ EMISSION IN MIXED AMORPHOUS-NANOCRYSTALLINE Si:H:Er FILMS, **S.B. Aldabergenova**, M. Albrecht and H.P. Strunk, Institut für Werkstoffwissenschaften, Universität Erlangen-Nürnberg, Cauerstr.6, 91058 Erlangen, Germany, J. Viner, P.C. Taylor, University of Utah, Salt Lake City UT84112, USA and A.A. Andreev, A.F.Ioffe Phys-Tech Institute, St.-Petersburg 194021, Russia

12:15 **LUNCH**

Tuesday May 30, 2000

Mardi 30 mai 2000

Afternoon

Après-midi

Session III - Er-doped Silicon I

Chairperson : F. Priolo

- K-III.1** 14:00 **Invited** STIMULATED EMISSION OF ERBIUM IONS FROM ERBIUM-DOPED OPTICALLY-PUMPED CRYSTALLINE AND AMORPHOUS SILICON STRUCTURES, **M.S. Bresler** and E.I. Terukov, A.F. Ioffe Physico-Technical Institute, Politekhnicheskaya 26, 194021 St. Petersburg, Russia
- K-III.2** 14:30 SEPARATION OF DISLOCATION- AND ERBIUM-RELATED PHOTOLUMINESCENCE BY TIME RESOLVED STUDIES, **K.D. Vernon-Parry**, I.D. Hawkins, J.H. Evans-Freeman and A.R. Peaker, Centre for Electronic Materials and Dept. of EE&E, UMIST, Manchester, UK, P. Dawson, Dept. of Physics, UMIST, Manchester, UK
- K-III.3** 14:50 ELECTRONIC MANIPULATION OF ENERGY TRANSFER IN Si:Er CRYSTAL, B.J. Pawlak and **T. Gregorkiewicz**, Van der Waals-Zeeman Institute, University of Amsterdam, Valckenierstraat 65, 1018 XE Amsterdam, The Netherlands
- K-III.4** 15:10 STRUCTURAL, ELECTRICAL AND OPTICAL PROPERTIES OF ER-O CO-DOPED SILICON FILMS GROWN BY MOLECULAR BEAM EPITAXY. **S. Scalese**, G. Franzo, S. Mirabella, M. Re, A. Terrasi, F. Priolo, E. Rimini: INFN & Dipartimento di Fisica, Università di Catania, Corso Italia 57, 95129 Catania, Italy; C. Spinella, CNR-IMETEM, Stradale Primosole 50, 95100 Catania, Italy; A. Carnera, INFN and Dipartimento di Fisica, Università di Padova, via Marzolo 8, 35131 Padova, Italy
- 15:30 **BREAK**

Session IV - Er-doped Silicon II

Chairperson : A. Kozanecki

- K-IV.1** 16:00 UNIFORMLY AND SELECTIVELY ERBIUM DOPED SILICON STRUCTURES PRODUCED BY THE SUBLIMATION MBE METHOD, M. Stepikhova, B. Andreev, O. Soldatkin, Z. Krasil'nik, Institute for Physics of Microstructures Russian Academy of Sciences, 603600 Nizhnij Novgorod GSP-105, Russia, V. Kuznetsov, V. Shabanov, E. Uskova, Nizhnij Novgorod State University, Gagarin Avn. 23, 603600 Nizhnij Novgorod, Russia, O. Gusev, A.F.Ioffe Physico-Technical Institute RAS, St.-Petersburg 194021, Russia
- K-IV.2** 16:20 PHOTOLUMINESCENT STRUCTURES WITH ELEVATED CONCENTRATION OF OPTICALLY ACTIVE ERBIUM PREPARED BY SUBLIMATION MOLECULAR BEAM EPITAXY, B.A. Andreev, Z.F. Krasil'nik, V.P. Kuznetsov, and A.O. Soldatkin, Institute of Physics of Microstructures, 603600 Nizhnii Novgorod, GSP-105, Russia; M.S.Bresler and O.B. Gusev, A.F. Ioffe Physico-Technical Institute, Politekhnikeskaya 26, 194021 St. Petersburg, Russia
- K-IV.3** 16:40 PHOTOLUMINESCENCE OF ERBIUM DOPED POROUS SILICON PREPARED BY ANODIC ETCHING OF MOLECULAR BEAM EPITAXIALLY GROWN SILICON, X.Y.Hou, L.L.Gu, Z.H.Xiong, G.Chen, S.H.Xu, Z.M.Jiang, and X.Wang, Surface Physics Laboratory, Fudan University, Shanghai 200433, China
- K-IV.4** 17:00 ELECTRONIC PROPERTIES OF ERBIUM DOPED AMORPHOUS SILICON, J.P. Kleider, C. Longeaud, Laboratoire de Génie Electrique de Paris, Plateau de Moulon, 91192 Gif-sur-Yvette Cedex, France, R. Meaudre, Département de Physique des Matériaux, Université de Lyon I, 43 Bd du 11 novembre 1918, 69622 Villeurbanne cedex, France, K.V. Koughia, Pediatric Medical Academy, Lirovskaya 2, 194100 St. Petersburg, Russia, E.I. Terukov, O.I. Konkov, A.F. Ioffe Physico-Technical Institute, Politechnicheskaya 26, 194021 St. Petersburg, Russia
- K-IV.5** 17:20 ROOM-TEMPERATURE PHOTOLUMINESCENCE FROM Er-DOPED MULTILAYERS POROUS SILICON MICROCAVITY, Y. Zhou, P. A. Snow, P. St.J. Russell, Department of Physics, University of Bath, Bath, BA2 7AY, UK
- K-IV.6** 17:40 EFFECTS OF OXYGEN COIMPLANTATION ON THE FORMATION OF SHALLOW DONORS IN ERBIUM-IMPLANTED SILICON, V. V. Emtsev, Jr., Van der Waals-Zeeman Institute, University of Amsterdam, Valckenierstraat 65, 1018 XE Amsterdam, The Netherlands, D.S. Poloskin, E.I. Shek, N.A. Sobolev, Ioffe Physicotechnical Institute, 194021 St. Petersburg, Russia and L.C. Kimerling, Materials Processing Center, MIT, Cambridge, MA 02139, USA

Wednesday May 31, 2000
Mercredi 31 mai 2000

Afternoon
Après-midi

Session V - Light Emitting Devices I
Chairperson : S. Coffa

- K-V.1** 14:00 **Invited** ERBIUM IN SI-BASED STRUCTURES, M. Lipson, T. Chen and **L.C. Kimerling**, Massachusetts Institute of Technology, USA
- K-V.2** 14:30 RARE EARTH DOPED GALLIUM NITRIDE - LIGHT EMISSION FROM ULTRAVIOLET TO INFRARED, A.J. Steckl, Nanoelectronics Laboratory, University of Cincinnati, Cincinnati OH 45221-0030, USA
- K-V.3** 14:50 ELECTRON AND HOLE IMPACT EXCITATION OF Er IN MBE-GROWN Si:O AND Si_(1-y)C_(y) DIODES, M. Markmann, K. Brunner, G. Abstreiter, Walter Schottky Institut, Am Coulombwall, 85748 Garching, Germany
- K-V.4** 15:10 1.55 MICRON IR ELECTROLUMINESCENCE FROM AN ELECTRIC FIELD-INDUCED Si-BASED BYPOLAR DEVICE, L. Chernyak, Department of Physics, University of Central Florida, Orlando FL 32816, USA, V. Lyahovitskaya, J. Gabboun, D. Cahen, Department of Materials & Interfaces, Weizmann Institute of Science, Rehovot 76100, Israel
- 15:30 **BREAK**

Session VI - Light Emitting Devices II
Chairperson : C. Abernathy

- K-VI.1** 16:00 **Invited** INFRARED LEDs USING ERBIUM-DOPED SILICON NANOCOMPOSITES, H.A. Lopez and **P.M. Fauchet**, University of Rochester, Rochester NY 14627, USA
- K-VI.2** 16:30 EFFICIENT ELECTROLUMINESCENCE FROM RARE EARTH DOPED MOS DIODE, S.Wang⁽¹⁾, S.Coffa⁽²⁾, R.Carius⁽¹⁾ and Ch. Buchal⁽¹⁾, ⁽¹⁾Institut für Schicht- und Ionentechnik (ISI-IT), Forschungszentrum Jülich GmbH, Germany, ⁽²⁾CNR-IMETEM, Catania, Italy
- K-VI.3** 16:50 EFFICIENT 1.54 μm LIGHT EMISSION FROM Si/SiGe/Si:Er:O TRANSISTORS PREPARED BY DIFFERENTIAL MOLECULAR BEAM EPITAXY, Chun-Xia Du, Wei-Xin Ni, Fabrice Duteil, and Göran V. Hansson, Dept. of Physics, Linköping University, 581 83 Linköping, Sweden
- K-VI.4** 17:10 HOLMIUM-RELATED LUMINESCENCE IN CRYSTALLINE SILICON, N.A. Sobolev, A.M. Emel'yanov and Yu.A. Nikolaev, Ioffe Physicotechnical Institute, 194021 St.Petersburg, Russia and B.A. Andreev and Z.F. Krasil'nik, Institute for Physics of Microstructures, 603600 Nizhny Novgorod, Russia

17:30 - 19:00 POSTER SESSION

- K/P1** OPTICAL BISTABILITY DERIVED FROM THE NEGATIVE NONLINEAR ABSORPTION EFFECT IN ERBIUM DOPED MATERIALS, Yoshinobu Maeda, Department of Information and Control Engineering, Toyota Technological Institute, 2-12-1 Hisakata, Tempaku, Nagoya 468-8511, Japan
- K/P2** ROOM-TEMPERATURE PHOTOLUMINESCENCE FROM Tb IONS IN SiO₂ AND a-SiC:H THIN FILMS DEPOSITED BY MAGNETRON CO-SPUTTERING, M. Sendova-Vassileva, M. Nikolaeva, D. Dimova-Malinovska, CL SENES, Bulgarian Academy of Sciences, 72 Tzarigradsko Chaussee, 1784 Sofia, Bulgaria and J.C. Pivin, CSNSM, IN2P3, CNRS, Batiment 108, 91405 OrsayCampus, France
- K/P3** EXAMINATION OF THE GROWTH PROCESS AND PROPERTIES OF RARE EARTH DOPED EPITAXIAL LAYERS OF 111-V COMPOUNDS, V.B.Ufimtsev, Institute of Chemical Problems for Electronics, Bol. Tolmachevsky per. 5, 109017 Moscow, Russia and V.V. Arbenina, Moscow State Academy of Fine Chemical Technology, Vernadskogo pr. 86, 117571 Moscow, Russia
- K/P4** PROPERTIES OF GaAs DOPED BY Yb, I.A. Bolshakova, Magnetic Sensor Laboratory, Lviv Polytechnical State University, Lviv, Ukraine, S.I. Krukovskii, I.R. Zaverbnyi, SRC "Carat", Lviv, Ukraine
- K/P5** EFFECT OF RARE EARTH-DOPING ON PARAMETERS OF LIQUID PHASE EPITAXY GROWN STRUCTURES BASED ON 111-V SEMICONDUCTORS, R.H. Akchurin, Moscow State Academy of Fine Chemical Technology, Vernadskogo pr. 86, 117571 Moscow, Russia and V.V. Arbenina, Moscow State Academy of Fine Chemical Technology, Vernadskogo pr. 86, 117571 Moscow, Russia
- K/P6** OPTICAL PROPERTIES OF PRASEODYMIUM (Pr) IMPLANTED Al_xGa_{1-x}N ALLOYS, C.J. Ellis, J.Y. Lin, and H.X. Jiang, Kansas State University, Manhattan, KS 66506, USA, J.M. Zavada, U.S. Army European Research Office, London NW15th, UK, R.G. Wilson, Consultant, Stevens Ranch CA 91381, USA
- K/P7** ALL-OPTICAL SIGNAL INVERTER DERIVED FROM NEGATIVE NONLINEAR ABSORPTION EFFECT, Toshikazu Yamada⁽¹⁾, Kazuhiko Tokoro⁽¹⁾ and Yoshinobu Maeda⁽²⁾, ⁽¹⁾Production fundamental Division, Chugoku National Industrial Research Institute, ⁽²⁾Department of Information and Control Engineering, Toyota Technological Institute, Japan
- K/P8** NEW LASER CRYSTALS BASED ON KPb₂Cl₅ FOR IR REGION, L. Isaenko, A. Yelisseyev, A. Tkachuk, S. Ivanova, S. Vatnik, A. Merkulov, Design & Technological Institute of Monocrystals SB RAS, 43 Russkaya str., Novosibirsk, 630058, Russia and S. Payne, M. Nostrand, R. Page, Lawrence Livermore Nat. Laboratory, L-482, Livermore CA 94550, USA
- K/P9** INFLUENCE OF O, B AND P IN Er-DOPED A-Si:H FILMS, Jianjun Liang, Weide Chen and Zhanguo Wang, Institute of Semiconductors, Chinese Academy of Sciences (CAS), Beijing 100083, China, Center for Condensed Matter Physics and State Key Laboratory for Surface Physics, CAS, China
- K/P10** LUMINESCENT PROPERTIES OF TERBIUM-DOPED Li₂B₄O₇ SINGLE CRYSTALS, POLYCRYSTALS AND GLASSES, B.M. Hunda, A.M. Solomon, V.M. Marunchak, I.I. Turok, P.P. Puga, Institute of Electron Physics, Ukrainian National Academy of Sciences, Department of the Quantum Electronics Optical Materials, 21 Universitetska st., Uzhgorod 88016, Ukraine
- K/P11** STRUCTURE PROPERTIES AND LUMINESCENCE OF EUROPIUM IN A2E4B2 NITRIDES, V. Bondar, L. Axelrud, V. Davydov, Yu. Dubov, S. Popovich, B. Padlyak, Lviv National University, Department of Physics, 50 Dragomanov Str., 79005 Lviv, Ukraine
- K/P12** PHOTOLUMINESCENCE AND X-RAY ABSORPTION NEAR EDGE STRUCTURE OF Eu IONS DOPED SiO₂ THIN FILMS, F. Liu, M. Zhu, Graduate School, Academia Sinica, USTC and State Key, Laboratory of Materials Chemistry and Applications, 100039 Beijing, China, Y. Hou, Institute of Optoelectronics, Northern Jiaotong University, 100044 Beijing, China and T. Liu, Synchrotron Radiation Laboratory, High Energy Physics Institute, 100039 Beijing, China
- K/P13** RARE EARTH IONS AS ACTIVATORS IN CERIUM DIOXIDE, N.I. Maneva, Department of Inorganic Chemistry, Sofia University, 1 James Bouchier Ave, 1164 Sofia, Bulgaria, M.K. Kuneva, Institute of Solid State Physics, 72 Tzarigradsko Chaussee Blvd, 1784 Sofia, Bulgaria, and Th. Barthel, Institute for Inorganic Chemistry, Cologne University, Greinstrasse 6, 50939 Cologne, Germany

- K/P14** AUGER DE-EXCITATION OF Er IONS DUE TO INJECTED FREE CARRIERS DURING THE IMPACT EXCITATION PROCESS, Wei-Xin Ni, Chun-Xia Du, Fabrice Duteil and Goeran V. Hansson, Dept. of Physics, Linköping University, 581 83 Linköping, Sweden
- K/P15** TERBIUM PHOTOLUMINESCENCE IN POLYSILOXANE FILMS, J.C. Pivin, Centre de Spectrometrie Nucleaire et de Spectrometrie de Masse, Bat 108, 91405 Orsay Campus, France; O.V. Sergeev, N.V. Gaponenko, V.E. Borisenko, Belarusian State University of Informatics and Radioelectronics, P.Browki St. 6, 220027 Minsk, Belarus; A.P. Stupak, Institute of Molecular and Atomic Physics, 220072 Minsk, Belarus; B. Hamilton, P. Skeldon, G.E. Thompson, University of Manchester Institute of Science and Technology, P.O.Box 88, Manchester M60 1QD, UK; J. Misiewicz, Institute of Physics, Technical University of Wrocław, Wybze Wyspianskiego 27, 50-370 Wrocław, Poland
- K/P16** SPECTROSCOPIC CHARACTERISTICS OF DOPED BY Er³⁺ IONS LEAD MOLYBDATE CRYSTALS, N.R. Aghamalyan, R.B. Kostanyan, T.V. Sanamyan, Institute for Physical Research of National Academy of Sciences of Armenia, 378410 Ashtarak-2, Armenia
- K/P17** a-Si(Er):H FILMS PREPARED BY METALORGANIC ASSISTED PECVD WITH HIGHLY HYDROGEN DILUTED SILANE, V.G. Golubev, N.A. Feoktistov, A.V. Medvedev, A.B. Pevtsov, Ioffe Physico-Technical Institute, RAS, 194021 St. Petersburg, Russia
- K/P18** HEAT RESISTANT a-Si(Er):H:F FILMS EMITTING AT 1.5 μm , V.G. Golubev, N.A. Feoktistov, A.V. Medvedev, A.B. Pevtsov, Ioffe Physico-Technical Institute, RAS, 194021 St. Petersburg, Russia; N.I. Gorshkov, D.N. Suglobov, Khlopin Radium Institute, RAS, 194021 St. Petersburg, Russia
- K/P19** PRODUCTION OF ER-DOPED SILICON EPITAXIAL LAYERS, L.S. Lunin, V.N. Lozovskii, S.V. Lozovskii, D.Y. Plushev, R.V. Demyan, South-Russian State Technical University, 132 Prosveshchena Street, 346400 Novochechassk, Russia
- K/P20** OPTICAL CHARACTERISATION OF Nd³⁺ IONS IN TELLURITE GLASSES, A. Kanoun, N. Jaba and H. Mejri Laboratoire de Physique des Semiconducteurs, Département de Physique, Faculté des Sciences de Monastir, 5019, Monastir, Tunisia
- K/P21** THE INFLUENCE OF RARE-EARTH ELEMENT Yb ON THE ELECTRICAL AND LUMINESCENT PROPERTIES OF ZINC SELENIDE SINGLE CRYSTALS, G.N.Ivanova, V.A.Kasiyan, D.D.Nedeoglo, Department of Semiconductor Physics, State University of Moldova, 60, A.Mateevich str., 2009 Kishinau, Moldova
- K/P22** SITE SELECTIVE EXCITATION OF Er-IMPLANTED GaN, H. Przybylinska and W. Jantsch, Johannes Kepler University, Altenbergerstr. 69, 4040 Linz, Austria, A. Kozanecki, Institute of Physics, Polish Academy of Sciences, Al. Lotników 32/46, 02-668 Warsaw, Poland
- K/P23** RANGE OF ION-IMPLANTED RARE EARTH ELEMENTS IN Si AND SiO₂, L. Palmethofer, Inst. f. Halbleiter- und Festkörperphysik, Johannes Kepler Universität, 4040 Linz, Austria, M. Gritsch, G. Hobler, Technical University, Vienna, and A. Kozanecki, Polish Academy of Sciences, Warsaw, Poland

Thursday June 1, 2000

Jeudi 1^{er} juin 2000

Morning

Matin

Session VII - Er-doped Silicon III

Chairperson : M. Bresler

- K-VII.1** 9:00 **Invited** RARE EARTH IONS - Si NANOCRYSTALS INTERACTIONS AND THEIR EFFECTS ON THE LUMINESCENCE PROPERTIES, **F. Priolo**, G. Franzò, D. Pacifici, V. Vinciguerra; INFN and Dipartimento di Fisica, Università di Catania, Corso Italia 57, 95129 Catania, Italy; F. Iacona, CNR-IMETEM, Stradale Primosole 50, 95121 Catania, Italy
- K-VII.2** 9:30 BROAD-BAND AND FLASHLAMP PUMPING OF 1.53 μm EMISSION FROM ERBIUM-DOPED SILICON NANOCRYSTALS, **A.J. Kenyon**, C.E. Chrystou, C.W. Pitt, Department of Electronic and Electrical Engineering, University College London, Torrington Place, London WC1E 7JE, UK, T.S. Iwayama, Department of Materials Science, Aichi University of Education, Igaya-cho, Kariya-shi, Aichi 448-8542, Japan, D.E. Hole, School of Engineering, University of Sussex, Falmer, Brighton BN1 9QH, UK, N. Sharma and C.J. Humphreys, Department of Materials Science and Metallurgy, University of Cambridge, Pembroke St, Cambridge CB2 3QZ, UK
- K-VII.3** 9:50 PHOTOLUMINESCENCE OF Er-DOPED a-Si:H IN PLANAR MICROCAVITY, **V.G.Golubev**, N.A.Feoktistov, A.V.Medvedev, A.B.Pevtsov, A.V.Sel'kin, Ioffe Physico-Technical Institute, 194021 St. Petersburg, Russia
- K-VII.4** 10:10 HIGH RESOLUTION DLTS OF HYDROGEN REACTIONS WITH DEFECTS IN ERBIUM-IMPLANTED SILICON, P.Y.Y. Kan, **K.F. Abd El-Rahman**, N. Abdelgadar, J.H. Evans-Freeman and A.R. Peaker, Centre for Electronic Materials and Dept EE&E, UMIST, Manchester, UK
- 10:30 **BREAK**

Session VIII - Er-doped Silicon IV

Chairperson : P. Fauchet

- K-VIII.1** 11:00 **Invited** SENSITIZATION OF THE 1.54 μm LUMINESCENCE OF Er⁺³ IN SiO₂ FILMS BY Yb AND Si NANOCRYSTALS, **A. Kozanecki**, Institute of Physics, Al. Lotnikow 32/46, 02-668 Warsaw, Poland, B.J. Sealy, University of Surrey, Guildford, Surrey GU2 5XH, UK, W. Jantsch, University of Linz, Austria
- K-VIII.2** 11:30 ERBIUM DOPED MICROCRYSTALLINE SILICON THIN FILMS PRODUCED BY REACTIVE MAGNETRON SPUTTERING, **M.F. Cerqueira**⁽¹⁾, M. V. Stepikova⁽²⁾ and J. A. Ferreira⁽¹⁾, ⁽¹⁾Departamento de Fisica, Universidade do Minho, Largo do Paço 4700-320 Braga, Portugal. ⁽²⁾Institute for Physics of Microstructures RAS, 603600 Nizhny Novgorod GSP-105, Russia
- K-VIII.3** 11:50 ROLE OF BACKGROUND EMISSION IN A FREE-ELECTRON LASER INDUCED QUENCHING OF PHOTOLUMINESCENCE OF Er⁽³⁺⁾ IN SILICON, **M. Forcales**, T. Gregorkiewicz, Van der Waals-Zeeman Institute, University of Amsterdam. Valckenierstraat 65, 1018 XE Amsterdam, The Netherlands, I.V. Bradley, J-P.R. Wells, FOM Institute Rijnhuizen, P.O. Box 1207, 3430 BE Nieuwegein, The Netherlands and Department of Physics, Heriot Watt University, Edinburgh EH14 4AS, UK
- K-VIII.4** 12:10 MECHANISM OF ELECTROLUMINESCENCE IN THE AMORPHOUS SILICON-BASED ERBIUM-DOPED STRUCTURES, **I.N. Yassievich**, M.S. Bresler, O.B. Gusev, P.E. Pak, K.D. Tsendin, and E.I. Terukov, Ioffe Physico-Technical Institute, St. Petersburg, Russia
- 12:30 **LUNCH**

Thursday June 1, 2000

Jeudi 1^{er} juin 2000

Afternoon

Après-midi

Session IX – RE-doped GaN I

Chairperson : G. Pomrenke

- K-IX.1** 14:00 **Invited** SPECTROSCOPIC STUDIES OF THE VISIBLE AND INFRARED LUMINESCENCE FROM Er DOPED GAN FILMS, **U. Hömmerich**, Hampton University, Department of Physics, Hampton VA 23668, USA
- K-IX.2** 14:30 LATTICE LOCATION STUDIES OF Pr IN GaN, **U. Wahl**, A. Vantomme, G. Langouche, University of Leuven, Instituut voor Kern- en Stralingsfysica, Celestijnenlaan 200 D, 3001 Leuven, Belgium, **J.P. Araújo**, IFIMUP, University of Porto, 4150 Porto, Portugal, **J. G. Correia** and the ISOLDE Collaboration, CERN, 1211 Genève 23, Switzerland
- K-IX.3** 14:50 ANNEALING BEHAVIOR OF LUMINESCENCE FROM ERBIUM-IMPLANTED GaN FILMS, **J.M. Zavada**, U.S. Army European Research Office, London NW15TH, UK, **C.J. Ellis**, **J.Y. Lin**, and **H.X. Jiang**, Kansas State University, Manhattan KS 66506, USA, **J.T. Seo**, **U. Hömmerich** and **M. Thaik**, Hampton University, Hampton VA 23668, **R.G. Wilson**, Consultant, Stevenson Ranch CA 91381, USA
- K-IX.4** 15:10 HIGH TEMPERATURE ANNEALING OF Er IMPLANTED GaN, **E.Alves**, **M.F.da Silva**, **J.C. Soares**, Instituto Tecnológico e Nuclear, EN10, 2686-953 Sacavem, Portugal, **R. Vianden**, **J. Bartels**, ISKP, University of Bonn, Bonn, Germany, **W. Lojkowski**, High Pressure Research Center, Sokolowska 29, 01-142 Warsaw, Poland, **T. Monteiro**, Departamento de Fisica, Universidade de Aveiro, 3810 Aveiro, Portugal
- 15:30 **BREAK**

Session IX – RE-doped GaN II

Chairperson : A. Steckl

- K-X.1** 16:00 **Invited** EFFECT OF IMPURITY CONCENTRATION ON 1.54 MICRON EMISSION FROM GAN:ER, **C. R. Abernathy**, Mark Overberg, J. Devin MacKenzie, Stephen J. Pearton, Dept. of Materials Science and Engineering, Rhines Hall, University of Florida, Gainesville FL 32606, USA, **Robert G. Wilson**, Stevenson Ranch CA 91381, USA, **John M. Zavada**, U.S. Army European Research Office, London NW1 5TH, UK
- K-X.2** 16:30 TEMPERATURE DEPENDENCE OF PHOTOLUMINESCENCE AND PHOTOLUMINESCENCE EXCITATION SPECTRA OF MULTIPLE Er³⁺ SITES IN Er-IMPLANTED GaN, **S. Kim***, **A.M. Mitofsky**, **S.J. Rhee**, **X. Li**, **J.J. Coleman** and **S.G. Bishop**; Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana IL 61801, USA; *Also Department of Electrical Engineering, Korea University, Seoul 136-701, Korea
- K-X.3** 16:50 LUMINESCENCE PROPERTIES OF GaN DOPED WITH Tb, **W. M. Jadwisienczak**, **H.J. Lozykowski**, School of Electrical Engineering & Computer Science and Condensed Matter & Surface Sciences Program, Ohio University, Stocker Center, Athens OH 45701, USA, **I. Brown**, Lawrence Berkeley Laboratory, University of California Berkeley, Berkeley CA 94720, USA
- K-X.4** 17:10 EXCITATION AND LUMINESCENCE SPECTRA OF Er³⁺ IONS IN AMORPHOUS-NANOCRYSTALLINE GaN:Er FILMS, **S.B. Aldabergenova**, **M. Albrecht** and **H.P. Strunk**, Institut für Werkstoffwissenschaften, Universität Erlangen-Nürnberg, Cauerstr.6, 91058 Erlangen, Germany, **J. Viner**, P.C. Taylor, University of Utah, Salt Lake City UT 84112, USA, and **A.A. Andreev**, A.F.Ioffe Phys-Tech Institute, St.-Petersburg 194021, Russia
- 17:30 **BREAK**

18:00 - 19:00 **PANEL SESSION**

Panel Members: **J. Langer, Panel Leader**

Institute of Physics, Polish Academy of Sciences, Poland

W. Jantsch

Johannes Kepler Universität, Linz, Austria

Gernot S. Pomrenke

National Science Foundation, Arlington, VA, USA

A. Polman

FOM Institute for Atomic and Molecular Physics, Amsterdam, The Netherlands

F. Priolo

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Friday June 2, 2000
Vendredi 2 juin 2000

Morning
Matin

Session XI – RE-doped Compound Semiconductors I
Chairperson : U. Hommerich

- K-XI.1** 9:00 **Invited** RARE EARTHS IN SEMICONDUCTORS AND RELATED MATERIALS, **G.S. Pomrenke**, NSF ENG/ECS, National Science Foundation, Arlington, VA 22230, USA
- K-XI.2** 9:30 STUDY ON THE ELECTRICAL AND COMPOSITIONAL PROPERTIES CHANGES INDUCED BY MECHANICAL POLISHING, CHEMICAL ETCHING AND THERMAL ANNEALING TREATMENTS IN BRIDGMAN-GROWN Gd-DOPED GaSb SUBSTRATES, J.L. Plaza⁽¹⁾, P. Hidalgo⁽²⁾, B. Mendez⁽²⁾, J. Piqueras⁽²⁾ and E. Dieguez⁽¹⁾, ⁽¹⁾Departamento de Física de Materiales, Universidad Autonoma de Madrid, Cantoblanco 28049 Madrid, Spain, ⁽²⁾Departamento de Fisica de Materiales, Universidad Complutense de Madrid, 28040 Madrid, Spain
- K-XI.3** 9:50 PHOTOLUMINESCENCE YTTERBIUM-DOPED AMORPHOUS HYDROGENATED SILICON CARBIDE, V.Kh. Kudoyarova⁽¹⁾, E.I. Terukov⁽¹⁾, A.N. Kuznetsov⁽¹⁾, G. Weiser⁽²⁾, H. Kuehne⁽²⁾, ⁽¹⁾A.F. Ioffe Physical Technical Institute, Russian Academy of Sciences, Politekhnicheskaya 26, 194021 St. Petersburg, Russia, ⁽²⁾Fachbereich Physik, Phylipps-Universität Marburg, 35032 Marburg, Germany
- K-XI.4** 10:10 COMPARISON OF PHOTOLUMINESCENCE DECAY FROM ERBIUM-DOPED SILICON AND SILICON-GERMANIUM HETEROSTRUCTURES, K.D. Vernon-Parry, I.D. Hawkins, J.H. Evans-Freeman and A.R. Peaker, Centre for Electronic Materials and Dept. of Electrical Engineering & Electronics, UMIST, Manchester, UK, P. Dawson, Dept. of Physics, UMIST, Manchester, UK
- K-XI.5** 10:30 CRYSTAL-FIELD SPLITTING OF ENERGY LEVELS AND TRANSITION DYNAMICS OF Pr³⁺4f² IN C_{3v} SITES IN GaN, Bahram Zandi, ARL/Adelphi Lab. Center, Sensors and Electron Devices Directorate, 2800 Powder Mill Rd., Adelphi, MD 20783, USA, J.B. Gruber, Physics Dept., San Jose State University, San Jose CA 95192, USA, H.J. Lozykowski, W.M. Jadwisienczak, School of Electrical Engineering & Computer Science, and Condensed Matter & Surface Sciences Program, Ohio University, Athens OH 45701, USA, I. Brown, Lawrence Berkeley Laboratory, University of California Berkeley, Berkeley CA 94720, USA
- 10:50 **BREAK**

Session XII – RE-doped Compound Semiconductors II

Chairperson : J. Zavada

- K-XII.1** 11:20 **Invited** LUMINESCENCE PROPERTIES OF Er,O-CODOPED GaP GROWN BY ORGANOMETALLIC VAPOR PHASE EPITAXY, **Yasufumi Fujiwara**, Tatsuhiko Koide and Yoshikazu Takeda, Department of Materials Science and Engineering, Graduate School of Engineering, Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464-8603, Japan
- K-XII.2** 11:40 **Invited** OPTIMIZATION OF Er CENTERS IN Si FOR REVERSE BIASED DIODES, **W. Jantsch**, G. Kocher, L. Palmetshofer, H. Przybylinska, M. Stepikhova and H. Preier, Inst. f. Halbleiter- und Festkörperphysik, Johannes Kepler Universität, 4040-Linz, Austria
- K-XII.3** 12:10 IMPURITIES AND DOPANTS IN III-NITRIDES MEASURED USING SECONDARY ION MASS SPETROMETRY, R.G. Wilson, Consultant, Stervenson Ranch CA, USA
- K-XII.4** 12:30 MAGNETIZATION AND MAGNETIC SUSCEPTIBILITY OF Gd BASED PbS, A. Errebbahi, S. Charar, V. Potin, GES, UMR 5650, Université Montpellier II, Place E. Bataillon, 34095 Montpellier Cedex 5, France, D. Ravot, J.C. Tedenac, LPCM, UMR 5617, Université Montpellier II, Place E. Bataillon, 34095 Montpellier Cedex 5, France, Z. Golacki, Institut of Physics, Polish Academy of Sciences, Al.Lornikow 32/46, 02-668 Warsaw, Poland
- 12:50 CLOSING REMARKS
- 13:15 **LUNCH**

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