13th Laser Ceramic Symposium: International Symposium on Transparent Ceramics for Photonic Applications

Fryazino, Russia 4th -8th Dec 2017

Programme

Monday, December 4th , 2017

8.00-21.00 **REGISTRATION**

19.00-19.30 **INTRODUCTORY GREETING**

19.30-20.00 **(INVITED) THERMAL-LENS-FREE HEAT CAPACITIVE ACTIVE MIRROR HCAM**

Prof. Ken-ichi UEDA [1,2,3]

[1] ILS/UEC, ILE/Osaka Univ., [2] Hamamatsu Photonics K.K., [3] Inst. Appl. Phys., RAS

20.00-20.30 **(INVITED) THIRD-ORDER-NONLINEAR EFFECTS IN CERAMICS**

E.A. Khazanov, O.V. Maslennikov, V.N. Ginzburg, A.A. Kochetkov, and V.I. Nekorkin
Institute of Applied Physics of the Russian Academy of Sciences
603950 Nizhny Novgorod, Russia

20.30- **WELCOME PARTY**

Tuesday, December 5th , 2017

9.00-18.00 **REGISTRATION**

9.00-9.20 **(INVITED) QUANTUM DESIGN OF MICRO-DOMAINS FOR GIANT PULSE LASERS**

T.Taira[1]

[1] Center for Mesoscopic Sciences, Institute for Molecular Science (IMS), National Institutes of Natural Science (NINS), 38 Nishigonaka, Myodaiji, Okazaki 444-8585, Japan.

9.20-9.40 **(INVITED) ADVANCED TRANSPARENT CERAMICS FOR PHOTONIC APPLICATIONS**

Jiang Li[1], Tengfei Xie[1], Huamin Kou[1], Yun Shi[1], Haohong Chen[1], Jiawei Dai[1], Zewang Hu[1], Zhaoxiang Yang[1], Yubai Pan[2]

[1]Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai 200050, China;

[2]Shanghai Normal University, Shanghai 200234, China

9.40-10.00 **(INVITED) ELECTROPHORETIC DEPOSITION OF NANOPARTICLES TO SINTER HIGHLY TRANSPARENT YTTRIA CERAMICS**

M. Ivanov[1], E. Kalinina[1], M. Bredol[2], U. Kynast[2]

[1]Institute of Electrophysics of the Ural Branch of the Russian Academy of Sciences, Ekaterinburg, Russia;

[2]Muenster University of Applied Sciences, Steinfurt, Germany

10.00-10.20 **(INVITED) PRODUCTION OF HOT-PRESSED ZnSe:Fe^{2+} LASER ACTIVE MEDIA AND STUDY OF THEIR GENERATION CHARACTERISTICS**

N.A. Timofeeva[1],R.I. Avetisov[1,2],S.S. Balabanov[1],K.N. Firsov[3],E.M. Gavrishuk[1], A.V. Khomyakov[2], V.B. Ikonnikov[1], V.P. Kalinushkin[3], S. Kazantsev[3], I.G. Kononov[3], E.N. Mozhevitina[1,2], D.V. Savin[1],O.V. Uvarov[3], I.C. Avetisov[2].

[1] G.G. Devyatykh Institute of Chemistry of High-Purity Substances of the RAS, Russia;
[2] D. Mendeleyev University of Chemical Technology of Russia, Russia; [3] Prokhorov General Physics Institute of RAS, Russia

10.20-10.40 **(INVITED) TWO-MICRON SOLID-STATE LASERS BASED ON Y_2O_3:Tm AND Y_2O_3:Ho CERAMICS**

Lyapin A.A.[1], Ryabochkina P.A.[1], Chabushkin A.N.[1], Kopylov Yu. L.[2], Balashov V.V.[2], Lopukhin K.V.[2]
[1]National Research Mordovia State University, Saransk, Russia
[2] Kotelnikov's IRE RAS, Moscow, Russia

10.40-11.00 **(INVITED) COMPARISON OF SPECTRAL-LUMINESCENCE PROPERTIES OF FLUORIDE SINGLE CRYSTALS AND CERAMICS**

P.P. Fedorov[1], S.V. Kuznetsov[1], V.V. Osiko[1], E.A. Garibin[2], A.A. Demidenko[2], M.Kh. Ashurov[3], and A.I. Ryskin[4]
[1]Prokhorov General Physics Institute RAS, Moscow, Russia;
[2]INCROM Ltd., St. Petersburg, Russia;
[3]Fonon State Research and Production Company, Tashkent, Uzbekistan;
[4]ITMO University, St. Petersburg, Russia

11.00-11.20 **COFFEE/TEA BREAK**

11.20-11.40 **(INVITED) HOT ISOSTATIC PRESSING OF TRANSPARENT Yb:Lu_2O_3 CERAMICS**

R.N. Maksimov[1,2], V.A. Shitov[1], A.S. Yurovskikh[2], V.R. Khrustov[1]
[1]Institute of Electrophysics UrB RAS, Ekaterinburg, Russia;
[2]Ural Federal University, Ekaterinburg, Russia

11.40-12.00 **(INVITED) Yb DOPED ($Lu_xY_{(1-x)})_2O_3$ MIXED SESQUIOXIDE CERAMICS: FABRICATION, SPECTROSCOPY AND LASER EMISSION**

G. Toci[1], A. Pirri[2], B. Patrizi[1], M. Vannini[1], V.V. Osipov[3], R.N. Maksimov[3,4], V.A. Shitov[3], A.S. Yurovskikh[4]
[1] C.N.R. - National Research Council, National Institute of Optics, INO-CNR, Sesto F.no, Italy;
[2] C.N.R. - National Research Council, Institute of Applied Physics "Nello Carrara", IFAC-CNR, Sesto F.no, Italy;
[3]Institute of Electrophysics UrB RAS, Ekaterinburg, Russia;
[4] Ural Federal University named after the first President of Russia B.N. Yeltsin, Ekaterinburg, Russia

12.00-12.20 **FABRICATION OF TRANSPARENT SESQUIOXIDE CERAMICS BY CHEMICAL CO-PRECIPITATION**

Danlei Yin[1,2], Jun Wang[1], Dewei Luo[2], Zhili Dong[2] ,and Dingyuan Tang[1,*]
[1] School of Electrical and Electronic Engineering, Nanyang Technological University,Singapore,
[2] School of Materials Science and Engineering, Nanyang Technological University, Singapore,

12.20-12.40 **(INVITED) SYNTHESIS AND CHARACTERISTICS OF Tb_2O_3 MAGNETO-OPTICAL CERAMICS**

V.A. Shitov, V.V. Osipov, V.V. Platonov, A.N. Orlov, R.N. Maksimov, K.E. Lukyashin and E.V. Tikhonov
Institute of Electrophysics UrB RAS, Yekaterinburg, Russia

12.40-13.00 **FABRICATION AND STRUCTURAL DESIGN OF Pr:$Lu_3Al_5O_{12}$ CERAMIC SCINTILLATORS**

Z.W. Hu [1,2], X.P.Chen[1,2], H.M Kou[1], Y.Shi[1], H.H.Chen[1], T.F.Xie[1], Y.B. Pan[3], A.Vedda[4], M. Nikl[5], J. Li[1*]
[1]Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China;
[2]University of Chinese Academy of Sciences, Beijing, China;
[3]Shanghai Normal University, Shanghai, China,
[4] Department of Materials Science, University of Milano-Bicocca, Milano, Italy,
[5]Institute of Physics AS CR, Prague, Czech R.

13.00-14.20 **LUNCH**

14.20-14.40 **(INVITED) FABRICATION OF $Tb_3Al_5O_{12}$ TRANSPARENT CERAMICS FOR MAGNETO-OPTICAL APPLICATIONS**

J.W. Dai[1,2], I.L. Snetkov[3], O.V. Palashov[3], Y.B. Pan[4], W. Wang[1], H.H. Chen[1], W. Luo[1], T.F. Xie[1], H.M. Kou[1], J. Li[1,*]
[1]Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China;
[2]University of Chinese Academy of Sciences, Beijing, China;
[3]Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia;
[4]Shanghai Normal University, Shanghai, China

14.40-15.00 **(INVITED) FABRICATION OF RARE EARTH OXIDES OPTICAL CERAMICS BY SINTERING OF THE SHS-DERIVED NANOPOWDERS**

D.A. Permin[1], S.S. Balabanov[1], E.M. Gavrishchuk[1], A.V. Novikova[1], I.L. Snetkov[2], O.V. Palashov[2]
[1]G.G. Devyatykh Institute of Chemistry of High-Purity Substances of the Russian Academy of Sciences, Nizhny Novgorod, Russia,
[2] Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia

15.00-15.20 **PLANAR YAG/Yb:YAG/YAG WAVEGUIDES FABRICATED VIA TAPE CASTING: PREPARATION, MICROSTRUCTURE AND LASER EMISSION CHARACTERIZATION**

G. Toci[1], J. Hostaša[2], A. Pirri[3], V. Biasini[2], B. Patrizi[1], L. Esposito[2], A. Piancastelli[2], M. Vannini[1]
[1] C.N.R. - National Research Council, National Institute of Optics, INO-CNR, Sesto F.no, Italy;
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[3] C.N.R. - National Research Council, Institute of Applied Physics “Nello Carrara”, IFAC-CNR, Sesto F.no, Italy

15.20-15.40 **(INVITED) FONON SPECTROSCOPY OF NANOSTRUCTURED CERAMICS**

A.A.Kaminskii[1], Yu.L.Kopylov[2], A.V.Taranov[2], E.N.Khazanov[2]
[1]FSC “Crystallography and Photonics” RAS, Moscow, Russia
[2]Kotel’nikov IRE RAS, Moscow, Russia

15.40-16.00 **(INVITED) THE RELATIONSHIP OF THE OPTICAL AND MECHANICAL PROPERTIES OF YSZ, $MgAl_2O_4$ CERAMICS MANUFACTURED BY SPS TECHNIQUE**

O.L. Khasanov, E.S. Dvilis, Z.G. Bikbaeva and V.D. Paygin
National Research Tomsk Polytechnic University, Tomsk, Russia

16.00-16.20 **FABRICATION, SPECTROSCOPY AND LASER EMISSION OF Yb:Sc_2O_3 TRANSPARENT CERAMICS FROM CO-PRECIPITATED NANO-POWDERS**

G. Toci[1], A. Pirri[2], Z. Dai[3,4], Q. Liu[4], V. Babin[5], M. Nikl[5], W. Wang[3], H. Chen[3], J. Li[3], M. Vannini[1]
[1] C.N.R. - National Research Council, National Institute of Optics, INO-CNR, Sesto F.no, Italy;
[2] C.N.R. - National Research Council, Institute of Applied Physics “Nello Carrara”, IFAC-CNR, Sesto F.no, Italy;
[3] Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China;
[4] School of Material Science and Engineering, Jiangsu University, Zhenjiang, China;
[5] Institute of Physics Academy of Sciences of the Czech Republic, Prague, Czech Republic

16.20-16.40 **(INVITED) FABRICATION YTTRIA NANOPOWDERS FOR LASER CERAMICS**

A.B.Arzmanova[1], E.L.Chuvilina[2]
[1] JSC «GIREDMET», Moscow, Russia
AAGasanov@giredmet.ru
[2] LLC «LANHIT», Moscow, Russia
Chuvilina.elena@lanhit.ru

16.40-17.00 **SYNTHESIS OF FINE-STRUCTURED Yb:Lu_2O_3 CERAMICS BY SPARK PLASMA SINTERING**

V.A. Shitov[1], R.N. Maksimov[1,2], L.R. Basyrova[2] and A.S. Yurovskikh[2]
[1]Institute of Electrophysics UrB RAS, Yekaterinburg, Russia;
[2]Ural Federal University, Yekaterinburg, Russia

17.00-17.20 **(INVITED) EFFECTIVE LUMINESCENT EMITTERS BASED ON RARE-EARTH GARNETS**

Soschin N.P.[1], Bolshukhin V.A.[1], Ulasyuk V.N.[2]
[1]NII «Platan» Fryazino, Russian Federation,
[2]ZAO «ELTAN» Fryazino, Russian Federation

17.20-17.40 **CONFERENCE PRESENTATION LCS2018 IN JAPAN**

T.Taira
Center for Mesoscopic Sciences, Institute for Molecular Science (IMS), National Institutes of Natural Science (NINS), 38 Nishigonaka, Myodaiji, Okazaki 444-8585, Japan.

Wednesday, December 6th , 2017

9.00-13.00 **EXCURSION TO RUSSIAN AIR FORCE MUSEUM (MONINO)**

13.00-14.20 **LUNCH**

14.20-14.40 **(INVITED) RECENT ADVANCEMENTS IN PRODUCTION OF LASER CERAMICS AT SLPG "RADUGA"**

V.V. Bezotosnuy[1,2], V.V. Balashov[3], V.D. Bulaev[4], A.Yu. Kanaev[4], V.B. Kravchenko[3], A.V. Kiselev[4] Yu.L. Kopylov[3], A.L. Koromuslov[1], O.N.Krokhin[1,2], K.V.Lopukhin[3], S.L.Lysenko[4], M.A.Pankov[4], K.A.Polevov[1,2], Yu.M.Popov[1,2], E.A.Cheshev[1,2], I.M.Tupicin[1,2]
[1] Lebedev Physics Institute RAS, Moscow, Russia
[2] MePhi, Moscow, Russia
[3] Kotelnikov's IRE RAS, Moscow, Russia
[4] SLPG "Raduga",

14.40-15.00 **SINGLE CaO ACCELERATED DENSIFICATION AND MICROSTRUCTURE CONTROL OF HIGHLY TRANSPARENT YAG CERAMIC**

Le Zhang[1], Tianyuan Zhou[1,2], Hao Chen[1], Deyuan Shen[1], and Dingyuan Tang[1]
[1] Jiangsu Key Laboratory of Advanced Laser Materials and Devices, School of Physics and Electroic Engineering, Jiangsu Normal University, Xuzhou, Jiangsu;
[2] College of Materials Science and Engineering, Nanjing Tech University, Nanjing, China

15.00-15.20 **PbF2:Eu3+ NANOPOWDERS AND TRANSPARENT FLUOROBORATE GLASS-CERAMICS**

O.B. Petrova[1], T.S. Sevostjanova[1], A.V. Khomyakov[1], M.N. Mayakova[2], V.V. Voronov[2]
[1]Mendeleev University of Chemical Technology of Russia, Moscow, Russia;
[2]Prokhorov General Physics Institute RAS, Moscow, Russia

15.00-15.20 **(INVITED) 100J LEVEL CERAMIC Yb:YAG CRYOGENIC GAS COOLED MULTI-SLAB DPSSL**

Jonathan Phillips, Mariastefania De Vido, Paul Mason, Klaus Ertel, Saumyabrata Banerjee, Oleg Chekhlov, Martin Divoky, Jan Pillar, Antonio Lucianetti, Jodie Smith, Tom Butcher, Waseem Shaikh, Chris Hooker, Cristina Hernandez-Gomez, Tomas Mocek, Chris Edwards, D. Meissner, S. Meissner, John Collier

15.20-15.40 **(INVITED) CW AND MODE-LOCKED HIGH POWER YB:LU_2O_3 CERAMIC LASER**

Shotaro Kitajima[1], Akira Shirakawa[1], Hideki Yagi[2], Takagimi Yanagitani[2]

[1]Institute for Laser Science, University of Electro-Communications, Chofu, Tokyo, Japan

[2]Takuma Works, Konoshima Chemical Co., Ltd., Mitoyo, Kagawa, Japan

Thursday, December 7th , 2017

9.00-9.20 **(INVITED) LASER CERAMICS STUDIES AT IAP RAS**

O.V. Palashov and I.L.Snetkov

Federal Research Center "Institute of Applied Physics of the Russian Academy of Sciences", Nizhny Novgorod, Russia

9.20-9.40 **(INVITED) MODIFICATION OF KAGAN MATRIX METHOD FOR CALCULATION OF THERMALLY INDUCED DEPOLARIZATION DISPERSION IN LASER CERAMICS**

A.G. Vyatkin* and E.A. Khazanov

Institute of Applied Physics Rus. Acad. Sci., Nizhny Novgorod, Russia

9.40-10.00 **(INVITED) MICROWAVE SINTERING AND HOT PRESSING OF RE:Tb2O3 TRANSPARENT CERAMICS**

S. S. Balabanov[1], S. V. Egorov[2], D.A. Permin[1], E. Ye. Rostokina[1], I.L. Snetkov[2] and A. A. Sorokin[2]

[1]G.G. Devyatykh Institute of Chemistry of High-Purity Substances of RAS, Nizhny Novgorod, Russia;

[2]Institute of Applied Physics of RAS, Nizhny Novgorod, Russia;

10.00-10.20 **THERMALLY INDUCED DEPOLARIZATION AND THERMAL LENS IN Tb_2O_3 TRANSPARENT CERAMICS**

I.L. Snetkov[1], D.A. Permin[2], S.S. Balabanov[2]

[1]Federal Research Center "Institute of Applied Physics of the Russian Academy of Sciences", Nizhny Novgorod, Russia;

[2]G.G. Devyatykh Institute of Chemistry of High-Purity Substances of the Russian Academy of Sciences, Nizhny Novgorod, Russia

10.20-10.40 **COFFEE/TEA BREAK**

10.40-13.00 **EXCURSION TO IPG PHOTONICS (FRYAZINO)**

13.00-14.15 **LUNCH**

14.15-16.00 **POSTER SESSION**

ONE-PASS OPTICAL AMPLIFICATION FOR LASER CERAMICS WITH LOSSES

Sergei M. Vatnik

Institute of Laser Physics, Novosibirsk, Russia

FABRICATION OF TRANSPARENT Yb:$Lu_3Al_5O_{12}$ CERAMICS USING NANOPARTICLES SYNTHESIZED BY LASER ABLATION

L.R. Basyrova[1], R.N. Maksimov[1,2], V.A. Shitov[2], K.E. Lukyashin[2]

[1]Ural Federal University, Yekaterinburg, Russia;

[2]Institute of Electrophysics UrB RAS, Yekaterinburg, Russia

PROSPECTS OF ACTIVE MEDIA BASED ON NANO- AND MICROPARTICLES

Yu.V. Senatsky[1], E.A. Cheshev[1], B.N. Chichkov[2], K.Kurselis[2], Yu. L. Kopylov[3], and V.A. Konyushkin[4]
[1]P.N.Lebedev Physics Institute of RAS, Moscow, Russia;
[2]Laser Zentrum Hannover e.V., Hannover, Germany;
[3]Kotelnikov's IRE RAS, Moscow, Russia
[4]A.M.Prokhorov General Physics Institute of RAS, Moscow, Russia.

EFFECT OF GREEN BODY ANNEALING ON LASER PERFORMANCE OF YAG:Nd CERAMICS

R.P. Yavetskiy[1], S.V. Parkhomenko[1], I.O. Vorona[1], A.V. Tolmachev[1], D.Yu. Kosyanov[2], V.G. Kuryavyi[3], V.Yu. Mayorov[3], L. Gheorghe[4] and G. Croitoru[4]
[1]Institute for Single Crystals, NASU, Kharkiv, Ukraine;
[2]Far Eastern Federal University, Vladivostok, Russian Federation;
[3]Institute for Chemistry, Vladivostok, Russian Federation;
[4]National Institute for Laser, Plasma and Radiation Physics, Bucharest, Romania

FABRICATION OF HIGHLY-DOPED Nd3+:Y3Al5O12 OPTICAL CERAMICS BY REACTIVE SPARK PLASMA SINTERING

D.Yu. Kosyanov[1], A.A. Vornovskikh[1], V.I. Vovna[1], A.G. Doroshenko[2], A.V. Tolmachev[2], V.G. Kuryavyi[3], E.K. Papynov[3], O.O. Shichalin[3]
[1]Far Eastern Federal University, Vladivostok, Russian Federation;
[2]Institute for Single Crystals, Kharkov, Ukraine;
[3]Institute of Chemistry, Vladivostok, Russian Federation

FABRICATION OF YAG:RE (Yb, Nd, Cr) CERAMICS USING DIVALENT SINTERING AIDS.

V.V. Balashov, Yu.L. Kopylov, V.B. Kravchenko, K.V. Lopukhin, V.V.Shemet
Institute of Radioengineering and Electronics named after V.A. Kotel'nikov RAS, Fryasino, Russia

PROBLEMS OF HIGH-QUALITY DOPED Y_2O_3-CERAMICS FABRICATION.

V.V. Balashov[1], Yu.L. Kopylov[1], V.B. Kravchenko[1], K.V. Lopukhin[1], P.A. Ryabochkina[2], A.N. Chabushkin[2]
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[2] N.P. Ogarev Mordovian State University, Saransk, Russia

16.00-18.00 **ROUND TABLE**
18.00- **CONFERENCE DINNER**

Friday, December 8th , 2017

9.00- **MOSCOW SIGHTSEEING**