

Boreskov Institute of Catalysis
Fritz Haber Institute of the Max Planck Society

5th Russian-German Seminar
“Bridging the Gap
between Model and Real Catalysis”
Synchrotron Radiation in Catalysis

June 23 - 26, 2019

Novosibirsk, Russia

Scientific Program

Novosibirsk-2019

Organised by

Boreskov Institute of Catalysis, Novosibirsk, Russia
&
Fritz Haber Institute of the Max Planck Society, Berlin, Germany



BORESKOV INSTITUTE
OF CATALYSIS



MAX PLANCK GESELLSCHAFT

Scientific Committee

- | | |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Prof. Dr. Valerii I. Bukhtiyarov | Boreskov Institute of Catalysis,
Novosibirsk, Russia |
| Prof. Dr. Robert Schlögl | Fritz Haber Institute
of the Max Planck Society,
Max Planck Institute for Chemical Energy
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| Prof. Dr. Alexander Yu. Stakheev | Zelinsky Institute of Organic Chemistry,
RAS, Moscow, Russia |
| Prof. Dr. Ekaterina.S. Lokteva | Lomonosov Moscow State University,
Moscow, Russia |

Organizing Committee

- | | |
|-----------------------------------------|---------------------------------------------------------------------|
| Prof. Dr. Valerii I. Bukhtiyarov | Boreskov Institute of Catalysis,
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| Dr. Axel Knop-Gericke | Fritz Haber Institute of the Max Planck
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| Dr. Marina V. Bukhtiyarova | Boreskov Institute of Catalysis,
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| Dr. Vasily V. Kaichev | Boreskov Institute of Catalysis,
Novosibirsk, Russia |

Secretariat

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|---------------------------|---------------------------------------------------------------------|
| Dorothea Damm | Fritz Haber Institute of the Max Planck Society,
Berlin, Germany |
| Marina S. Suvorova | Boreskov Institute of Catalysis, Novosibirsk, Russia |

Language

English is the official language of the seminar

Scientific program

The scientific program of seminar includes plenary lectures (40 min) and oral presentations (20 min).

The main topics are:

- in situ and operando studies of model and real catalysts
- advanced synchrotron methods in catalysis
- electrocatalysis

Abstract submission and publication

Authors of all contributions are invited to submit one or two page abstracts (A4) in English. Tables, artworks and references will be accepted within this limit. The text should be typed 1.25 line spaced with 2.5 cm all around margins. Please use Calibri 12 pt. References should be cited in the order of occurrence in the text as numbers in square brackets [1]. Please use the example of abstract on the conference site <http://conf.nsc.ru/rgs-2019/en>.

Venue and Accommodation

The Seminar will take place in Borekov Institute of Catalysis and a conference-centre of the **Morozovo hotel** (Novosibirsk region, Rechkunovskaya recreation area – 1.

Accommodation is arranged by the Organizing Committee at the **Morozovo hotel**.

Accommodation 23-26 June 2019 (STANDARD, single/twin) is included in registration fee. Please send an application for accommodation after notification of acceptance.

Transportation

Novosibirsk Airport “Tolmachevo” is located about 30 km from Akademgorodok. The representatives of the Organizing Committee will meet participants at the Airport in the morning, 23 June and provide transportation to the hotel by a special transport (the representatives will have the transparencies with the 5th Russian-German Seminar on Catalysis logo). The transfer from Boreskov Institute to the Morozovo hotel will be organized.

Entry visa to Russia

All foreign participants of the Seminar need a valid passport and an entry visa to Russia (passport should be valid 6 months after Seminar – at least until 1st of January, 2020).

Detailed information is given at the [site](#).

Registration and fee

Those who plan to attend the Seminar are kindly requested to register at the [website](#) before 1 April 2019. Authors are also requested to send their abstracts and registration form as attached Word-files by e-mail: suvorova@catalysis.ru.

For Russian participants: 10 000 Rubles

For foreign participants: 200 Euro

The registration fee covers all Conference documentation and materials, accommodation, meals, Welcome reception, refreshments.

For foreign participants:

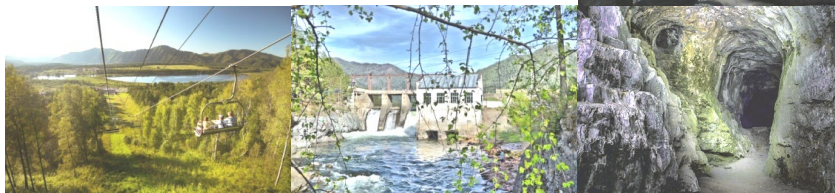
To receive an invoice for the registration fee payment, please fill in the form on the site and send it to Organizing Committee (Marina Suvorova e-mail: suvorova@catalysis.ru).

For Russian participants:

Russian participants can transfer the registration fee after receiving Notification of acceptance of report.

Post-tour to Altai

The tour to Altai will start at 10.00
26 June 2019 from the Morozovo hotel.



Key Dates

1 April 2019	Submission of preliminary registration forms and Abstracts
15 April 2019	Notification of acceptance
15 April – 15 May 2019	Payment of fee
1 June 2019	Distribution of preliminary Scientific Program
23-26 June 2019	Working days
26-29 June 2019	Post-tour to Altai

Contacts

Germany: **Dorothea Damm**,
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Berlin
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Russia : **Marina Suvorova**,
Boreskov Institute of Catalysis,
Novosibirsk
E-mail: suvorova@catalysis.ru
Tel: +7 (383) 326-95-84

Schedule

June 23, Sunday		June 24, Monday	
	Arrival		<i>Chair: Knop-Gericke A.</i>
		09.30	PL-3 – Savinova
		10.10	PL-4 – Steinrück
		10.50	OP-6 – Behm
		11.10	Coffee-break
			<i>Chair: Steinrück H.</i>
		11.40	OP-7 – Smirnova
		12.00	OP-8 – Abdel-Mageed
		12.20	OP-9 – Saraev
		12.40	OP-10 – Bulavchenko
		13.00	OP-22 – Kaichev
		13.30	Lunch
			<i>Chair: Zubavichus Yan</i>
		15.00	OP-12 – Stotz
		15.20	OP-13 – Sulzman
14:00	Registration	15.40	OP-14 – Bukhtiyarova M.
14:45	Opening Session	16.00	OP-15 – Alekseeva
	<i>Chair: Bukhtiyarov V.</i>	16.20	OP-16 – Pakharukova
15:00	PL-1 – Knop-Gericke	16.40	OP-17 – Shefer
15:40	PL-2 – Zubavichus		
16:20	Coffee-break		
	<i>Chair: van de Krol R.</i>		
16:50	OP-1 – Shmakov		
17:10	OP-2 – Belyakova		
17:30	OP-3 – Nikitina		
17:50	OP-4 – Bukhtiyarov A.		
18:10	OP-5 – Mamatkulov		
19.00	Welcome Party	19.00	Banquet

of the Seminar

June 25, Tuesday		June 26-29
09.30	<i>Chair: Savinova E.</i> PL-5 – van de Krol	<p>Post-tour to Altai 26 – departure to Altai 27, 28 – Excursion program 29 - departure to Novosibirsk</p>
10.10	PL-6 – Kiskinova	
10.50	OP-18 – Kuznetsov	
11.10	Coffee-break	
	<i>Chair: Kiskinova M.</i>	
11:40	OP-19 – Hävecker	
12:00	OP-20 – Kibis	
12:20	OP-21 – Wittkämper	
12:40	OP-11 – Skorupska	
13:00	OP-23 – Balyakin	
13.30	Lunch	
14:30	departure to Boreskov Institute of Catalysis	
15.00	Excursion to Boreskov Institute of Catalysis	
16.00	PL-7 – Bukhtiyarov V.	
17.00	PL-8 – Schlögl (Video Lecture)	
18.00	Closing Ceremony	
19.00	Dinner	

PL – Plenary Lecture (40 min)

OP – Oral Presentation (20 min)

Scientific Program

June 23, Sunday

*Morozovo Hotel
Conference hall, 4th floor*

AFTERNOON SESSION

Chairperson: Prof. Dr. Valerii Bukhtiyarov

14.45 Opening Session

Plenary Lectures

15.00 PL-1

Presenting author: **Dr. Axel Knop-Gericke**

The Electronic Structure of Solid/Liquid Interfaces Relevant for Water Oxidation and Carbondioxide Reduction

1 – MPI for Chemical Energy Conversion, Mülheim, Germany

2 – Fritz-Haber-Institute of the MPG, Berlin, Germany

15.40 PL-2

Presenting author: **Prof. Dr. Yan Zubavichus**

Structural Diagnostics of Catalysts Using X-Ray Synchrotron Radiation: Current Possibilities and Future Prospects

Boreskov Institute of Catalysis, Novosibirsk, Russia

16.20 Coffee-break

16.50 OP-1

Presenting author: **Dr. Alexander Shmakov**

Shmakov A.N., Vinokurov Z.S., Yakushkin S.S., Nesterov N.S.,
Martyanov O.N.

High Energy X-Ray Synchrotron In Situ and Operando Diagnostics of Heterogeneous Catalysts

Boriskov Institute of Catalysis, Novosibirsk, Russia

17.10 OP-2

Presenting author: **Dr. Olga Belyakova**

Belyakova O.A.¹, Zubavichus Ya.V.¹, Vasil'kov A.Y.², Naumkin A.V.²

The Study of Au/Ni Bimetallic Nanoparticles Using a Combination of XAFS, XRD and SAXS/ASAXS Synchrotron Techniques

1 – Boriskov Institute of Catalysis, Novosibirsk, Russia

*2 – A.N.Nesmeyanov Institute of Organoelement Compounds RAS,
Moscow, Russia*

17.30 OP-3

Presenting author: **Nadezhda Nikitina**

Pichugina D.A., Nikitina N.A., Kuz'menko N.E.

On the Mechanism of CO Oxidation on Gold Nanocluster: Ligand and Doping Effects

M.V. Lomonosov Moscow State University, Moscow, Russia

17.50 OP-4

Presenting author: **Dr. Andrei Bukhtiyarov**

Bukhtiyarov A.V.¹, Prosvirin I.P.¹, Mamatkulov M.¹, Yudanov I.V.^{1,2},
Klyushin A.Yu.³, Knop-Gericke A.³, Neyman K.M.^{4,5}, Bukhtiyarov V.I.¹

CO Oxidation on the Model Pd-Au/HOPG Catalysts: NAP XPS and MS Study

1 – Borekov Institute of Catalysis, Novosibirsk, Russia

2 – Institute of Chemistry and Chemical Technology SB RAS, Federal Research Center “Krasnoyarsk Scientific Center SB RAS”, Krasnoyarsk, Russia

3 – Fritz-Haber-Institute der Max Planck Society, Berlin, Germany

4 – Departament de Ciència de Materials i Química Física and Institut de Química Teòrica i Computacional, Universitat de Barcelona, Barcelona, Spain

5 – ICREA (Institució Catalana de Recerca i Estudis Avançats), Barcelona, Spain

18.10 OP-5

Presenting author: **Dr. Mikhail Mamatkulov**

Mamatkulov M.I.¹, Yudanov I.V.^{1,2}, Neyman K.M.^{3,4}

Atomic Ordering in Bimetallic Pd-Au Nanoparticles: Computational Study of Pd Surface Segregation in Reactive Environment

1 – Borekov Institute of Catalysis, Novosibirsk, Russia

2 – Institute of Chemistry and Chemical Technology SB RAS, Krasnoyarsk, Russia

3 – Universitat de Barcelona, Barcelona, Spain

4 – Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain

19.00 Welcome Party

June 24, Monday

*Morozovo Hotel
Conference hall, 4th floor*

MORNING SESSION

Chairperson: Dr. Axel Knop-Gericke

Plenary Lectures

09.30 PL-3

Presenting author: **Prof. Dr. Elena Savinova**

Electrocatalysis at the Molecular Level: from Electrochemical Methods to In Situ Spectroscopies

UMR 7515 CNRS - University of Strasbourg, Strasbourg, France

10.10 PL-4

Presenting author: **Prof. Dr. Hans-Peter Steinrück**

Surface Science of Low Vapor Pressure Liquids

Physical Chemistry, University Erlangen-Nürnberg, Erlangen, Germany

15.40 OP-6

Presenting author: **Prof. Dr. Rolf Jürgen Behm**

Wiese K.¹, Rezvani A.¹, Ali M. Abdel-Mageed¹, Klyushin A.²,

Knop-Gericke A.², Schlögl R.², Behm R.J.¹

Insights into Fundamental Aspects of Au Catalysis from Operando and In Situ Spectroscopy: Methanol Synthesis on Au/ZnO as a Key Example

1 – Institute of Surface Chemistry and Catalysis, Ulm University, Ulm, Germany

2 – Fritz-Haber-Institute, Department of Inorganic Chemistry, Berlin, Germany

11.10 Coffee-break

ORAL SESSION

Chairperson: Prof. Dr. Hans-Peter Steinrück

11.40 OP-7

Presenting author: **Dr. Nadezhda Smirnova**

Smirnova N.S.¹, Khramov E.V.², Stolyarov I.P.¹, Cherkashina N.V.¹,
Baeva G.N.³, Bragina G.O.³, Yakushev I.A.¹, Mashkovsky I.S.³,
Vargaftik M.N.¹, Stakheev A. Yu.³

The Investigation of Thermal Decomposition of Heterobimetallic PtZn(CH₃COO)₄ Acetate Complex in Reductive Conditions by *In Situ* XAFS

1 – N.S. Kurnakov Institute of General and Inorganic Chemistry, Russian Academy of Sciences, Moscow, Russia

2 – National Research Center «Kurchatov Institute», Moscow, Russia

3 – N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia

12.00 OP-8

Presenting author: **Ali M. Abdel-Mageed**

Ali M. Abdel-Mageed¹, Fauth C.¹, Rungtaweivoranit B.², Yaghi O.M.², Behm R.J.¹

On the Electronic and Geometric Structure of a Single Atom Cu/UiO-66 Catalyst during CO Oxidation: An Operando FTIR and XAFS Study

1 – Institute of Surface Chemistry and Catalysis, Ulm University, Ulm, Germany

2 – Department of Chemistry, University of California, Berkeley, California, USA

12.20 OP-9

Presenting author: **Dr. Andrey Saraev**

Saraev A.A.¹, Tsapina A.M.¹, Selivanova A.V.¹, Fedorov A.V.¹, Vorokhta M.², Šmíd B.², Kaichev V.V.¹

NAP XPS Study of CO Oxidation over CuFeAl Nanocomposite Catalysts

1 – Borekov Institute of Catalysis, Novosibirsk, Russia

2 – Charles University, Prague, Czech Republic

12.40 OP-10

Presenting author: **Dr. Olga Bulavchenko**

Bulavchenko O.A.^{1,2}, Vinokurov Z.S.^{1,2}, Afonassenko T.N.¹,
Tsyrl'nikov P.G.³, Saraev A.A.^{1,2}, Kaichev V.V.^{1,2}, Tsybulya S.V.^{1,2}

In Situ XRD and XPS Study of the Reduction Process of Mixed Mn-Zr Oxide Catalysts of CO Oxidation

1 – *Boreskov Institute of Catalysis, Novosibirsk, Russia*

2 – *Novosibirsk State University, Novosibirsk, Russia*

3 – *Center of New Chemical Technologies BIC, Omsk, Russia*

13.00 OP-22

Presenting author: **Dr. Vasily Kaichev**

Kaichev V.V.^{1,2}, Chesalov Yu.A.^{1,2}, Saraev A.A.^{1,2}, Tsapina A.M.¹

In Situ Study of Dehydrogenation of Propane over Vanadia-Titania Catalysts

1 – *Boreskov Institute of Catalysis, Novosibirsk, Russia*

2 – *Novosibirsk State University, Novosibirsk, Russia*

13.30 Lunch

AFTERNOON SESSION

Chairperson: *Prof. Dr. Yan Zubavichus*

15.00 OP-12

Presenting author: **Dr. Eugen Stotz**

Stotz E.¹, Hävecker M.^{1,2}, Valsco-Velez J.J.^{1,2}, Knop-Gericke A.^{1,2},
Schlögl, R.^{1,2}

Modular Concept for Catalysis Research at BESSY from an Engineer Point of View

1 – *Fritz-Haber-Institute of the Max-Planck-Society, Berlin, Germany*

2 – *Max-Planck-Institute for Chemical Energy Conversion, Mülheim, Germany*

15.20 OP-13

Presenting author: **Frederic Paul Sulzman**

Sulzmann F.¹, Carbonio E.³, Jones T.¹, Knop-Gerincke A.², Schlögl R.^{1,2}

Differentiation of Strongly Bound Oxygen on Silver

1 – Fritz-Haber-Institut der Max-Planck-Gesellschaft, Department of Inorganic Chemistry, Berlin, Germany

2 – Department of Heterogeneous Reactions, Max Planck Institute for Chemical Energy Conversion, Mülheim an der Ruhr, Germany

3 – Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, BESSY II, Berlin, Germany

15.40 OP-14

Presenting author: **Dr. Marina Bukhtiyarova**

Bukhtiyarova M.V., Prosvirin I.P., Bukhtiyarov A.V., Panafidin M.A.

In Situ XPS Study of Selective Methanol Oxidation over Cu Catalysts on the Base of Layered Double Hydroxides

Boreskov Institute of Catalysis, Novosibirsk, Russia

16.00 OP-15

Presenting author: **Dr. Mariya Alekseeva**

Alekseeva M.V.^{1,2}, Smirnov A.A.^{1,2}, Selischeva S.A.^{1,2}, Shilov I.N.^{1,2}, Fedorov A.V.^{1,2}, Bulavchenko O.A.^{1,2}, Saraev A.A.^{1,2}, Yakovlev V.A.^{1,2}

In Situ and Advanced Synchrotron Studies of Catalysts for Bio-Oxygenates Hydroconversion

1 – Boreskov Institute of Catalysis, Novosibirsk, Russia

2 – Novosibirsk State University, Novosibirsk, Russia

16.20 OP-16

Presenting author: **Dr. Vera Pakharukova**

Application of Pair Distribution Function Analysis to Structural Studies of Supported Catalysts

1 – Borekov Institute of Catalysis, Novosibirsk, Russia

2 – Novosibirsk State University, Novosibirsk, Russia

16.40 OP-17

Presenting author: **Dr. Kristina Shefer**

Shefer K.I.^{1,2}, Moroz E.M.¹

Nanoscale Catalytic Systems Based on Alumina and Aluminum Hydroxides. Reserch Using the PDF Method

1 –Borekov Institute of Catalysis, Novosibirsk, Russia

2 – Novosibirsk State University, Novosibirsk, Russia

19.00 Banquet

June 25, Tuesday

*Morozovo Hotel
Conference hall, 4th floor*

MORNING SESSION

Chairperson: Prof. Dr. Elena Savinova

Plenary Lectures

09.30 PL-5

Presenting author: **Prof. Dr. Roel van de Krol**

Van de Krol R., Friedrich D., Eichberger R., Favaro M., Starr D.E.

Time-Resolved and Operando Photoemission Studies on Metal Oxide Photoelectrodes

Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Institute for Solar Fuels, Berlin, Germany

10.10 PL-6

Presenting author: **Dr. Maya Kiskinova**

Microscopic Insights on Properties of Catalysts Using Synchrotron-Based Methods

Elettra-Sincrotrone Trieste, Area Science Park, Trieste-Basovizza, Italy

10.50 OP-18

Presenting author: **Prof. Dr. Mikhail Kuznetsov**

Kuznetsov M.V.¹, Ogorodnikov I.I.¹, Usachov D.Yu.², Yashina L.V.³

Photoelectron Diffraction and Holography for Surface Structure Studies

1 – Institute of Solid State Chemistry, Ural Branch of the Russian Academy of Sciences, Ekaterinburg, Russia

2 – St. Petersburg State University, Dept. of Physics, St. Petersburg, Russia

3 – Moscow State University, Dept. of Chemistry, Moscow, Russia

11.10 *Coffee-break*

ORAL SESSION

Chairperson: *Dr. Maya Kiskinova*

11.40 OP-19

Presenting author: **Dr. Michael Hävecker**

Koch G.^{1,2}, Hävecker M.^{2,3}, Kube P.², Bellini G.³, Trunschke A.³, Stotz E.³, Schlögl R.^{2,3}

The Rich Surface Oxygen Chemistry of Perovskites as Revealed by Synchrotron Based Ambient Pressure X-ray Photoelectron Spectroscopy (AP-XPS)

1 – TU Berlin, BasCat-BASF Joint Lab, Berlin, Germany

2 – MPI for Chemical Energy Conversion, Mülheim a.d.Ruhr, Germany

3 – Fritz Haber Institute, Berlin, Germany

12.00 OP-20

Presenting author: **Dr. Lidiya Kibis**

Kibis L.S.^{1,2}, Svintsitskiy D.A.^{1,2}, Derevyannikova E.A.¹, Kardash T.Yu.^{1,2}, Slavinskaya E.M.^{1,2}, Stonkus O.A.^{1,2}, Svetlichnyi V.A.³, Boronin A.I.^{1,2}

In Situ/Ex Situ Study of Model Rh-Doped CeO₂ Catalysts

1 – Borekov Institute of Catalysis, Novosibirsk, Russia

2 – Novosibirsk State University, Novosibirsk, Russia

3 – Tomsk State University, Tomsk, Russia

12.20 OP-21

Presenting author: **Dr. Haiko Wittkämper**

Wittkämper H.¹, Raman N.², Grabau M.¹, Maisel S.³, Taccardi N.², Debuschewitz J.², Bauer T.⁵, Wu M.⁴, Haumann M.², Görling A.³, Spiecker E.⁴, Libuda J.⁵, Wasserscheid P.², Steinrück H.-P.¹, Papp C.¹

Spectroscopic Insights to Rh-Ga Alloys as Model Systems for a Novel Type of Dehydrogenation Catalyst

1 – Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Lehrstuhl für Physikalische Chemie II, Erlangen, Germany

2 – Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Lehrstuhl für Chemische Reaktionstechnik (CRT), Erlangen, Germany

3 – *Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Lehrstuhl für Theoretische Chemie, Erlangen, Germany*

4 – *Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Lehrstuhl für Werkstoffwissenschaften, Mikro- und Nanostrukturforschung, Erlangen, Germany*

5 – *Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Lehrstuhl für Katalytische Grenzflächenforschung, Erlangen, Germany*

12.40 OP-11

Presenting author: **Dr. Katarzyna Skorupska**

Skorupska K., Jone D.T., Mom R., Sulzmann F., Chuang Ch.-H., Melder J., Kurz P., Knop-Gericke A., Schlögl R.

Manganese Oxides under OER

Fritz-Haber-Institut of the Max-Planck Society, Berlin, Germany

13.00 OP-23

Presenting author: **Ilya Balyakin**

Balyakin I.A.^{1,2,3}, Rempel A.A.^{1,2,3}

Computer Modeling of CdS-TiO₂ Heterojunctions in Photo Catalyst

1 – *Institute of Solid State Chemistry of the Ural Branch of the Russian Academy of Sciences, Ekaterinburg, Russia*

2 – *Ural Federal University, Ekaterinburg, Russia*

3 – *Institute of Metallurgy of the Ural Branch of the Russian Academy of Sciences, Ekaterinburg, Russia*

13.30 Lunch

AFTERNOON SESSION

14.30 Departure to Boreskov Institute of Catalysis

15.00 Excursion to Boreskov Institute of Catalysis

*Boreskov Institute of Catalysis, Novosibirsk, Russia
Conference hall, 3th floor*

Plenary Lectures

16.00 PL-7

Presenting author: **Prof. Dr. Valerii I. Bukhtiyarov**

Synchrotron in Catalysis

Boreskov Institute of Catalysis, Novosibirsk, Russia

17.00 PL-8 (Video Lecture)

Presenting author: **Prof. Dr. Robert Schlöegl**

Material Science of Heterogeneous Catalysts

Fritz Haber Institute of the Max Planck Society, Berlin, Germany

*Max Planck Institute for Chemical Energy Conversion, Mülheim,
Germany*