



The Russian Academy of Sciences: The Past, Present and Future of Russian-German Cooperation





Georg Bilginer



Christian Goldbach



Christian Wolf



On February 8, 1724, the Senate approved Peter I's project to establish the Academy of Sciences and Arts in St. Petersburg. Christian Wolf, a student and follower of the great Leibniz, called the Academy a “Paradise for scientists”. Wolf was one of the world-famous scientists whom Peter I wanted to invite to Russia to work at the Academy. Among the first people invited to Russia were mathematician Christian Goldbach, physicist Georg Bilginer, and historian Gerhard Friedrich Miller.



Georg Bernhard Bilfinger-Academician and Foreign Honorary Member of the St. Petersburg Academy of Sciences, one of the founders of the Physical Cabinet of the Academy of Sciences.

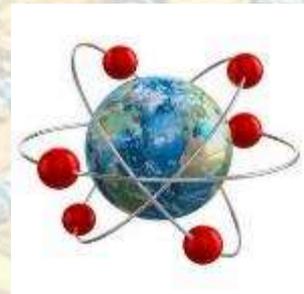
The foundation of the Academy marked the beginning of Russian-German scientific cooperation. In 2024, when the 300-th anniversary of the Russian Academy of Sciences will be celebrated, the same number of years will have passed since the start of our cooperation.

The Russian Academy of Sciences (RAS) is charged with ensuring the continuity and coordination of fundamental scientific research and exploratory research conducted in the most important areas of natural, technical, medical, agricultural, social and humanitarian sciences, expert scientific support for the activities of state authorities, scientific and methodological guidance of scientific and scientific-technical activities of scientific and educational organizations of higher education.



At the moment, the RAS includes 13 specialized Departments (by fields and directions of science):

1. Department of Mathematical Sciences
2. Department of Physical Sciences
3. Department of Nanotechnologies and Information Technologies
4. Department of Power Engineering, Mechanical Engineering, Mechanics and Control Processes
5. Department of Chemistry and Materials Sciences
6. Department of Biological Sciences
7. Department of Physiological Sciences
8. Department of Earth Sciences
9. Department of Social Sciences
10. Department of Global Problems and International Relations
11. Department of Historical and Philological Sciences
12. Department of Medical Sciences
13. Department of Agricultural Sciences





3 regional Branches: Siberian, Ural and Far Eastern

3 RAS Representative Offices

The RAS provides scientific and methodological guidance to 457 scientific institutions and research centers.



The total number of members of the Academy is 1990 (correct on 01.09.2020) including:
873 Academicians of the RAS;
1117 Corresponding Members of the RAS;
606 Professors of the RAS;
458 foreign members of the Russian Academy of Sciences from 54 countries were elected to the Academy.



Academy of Sciences from 54 countries were elected to the Academy.
The Academy carries out international cooperation with scientific organizations from more than 80 countries, with which more than 300 agreements have been concluded.

In July 2018, amendments to Federal law No. 253-F3 of 27.09.2013 “On the Russian Academy of Sciences” granted the Academy additional powers to carry out international activities and create a new image of Russian science abroad.

These new features are:

- conducting basic and applied research in cooperation with foreign scientific organizations;
- organization of international academic exchange;
- participation on behalf of the Russian Federation in the implementation of international programs and projects;
- promoting the development of relations with state and non-state foreign structures.





In 2019, the Russian Academy of Sciences delegation headed by President Academician Alexander M. Sergeev visited the Jülich Research Centre for talks on cooperation in the framework of “The Human Brain Project”, and participated in meeting with colleagues of the Institute of Neuroscience and Medicine (INM), Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons (ER-C), the Peter Grünberg Institute (PGI), the Institute for predictive modeling, and other research institutions of the Center.

Institute for Advanced Brain Research of Lomonosov Moscow State University, Institute of Higher Nervous Activity and Neurophysiology RAS, Burdenko National Research Center of Neurosurgery, Program Systems Institute RAS, Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry cooperate with the Jülich Research Centre on this project.

In 2019, the Russian-German Forum “Brain Sciences: fundamental and applied aspects” was held at the Russian Academy of Sciences and Moscow State University.



The collaboration between Lebedev Physical Institute RAS and Ludwig Maximillan Universitat (LMU) has been going on for more than 15 years.

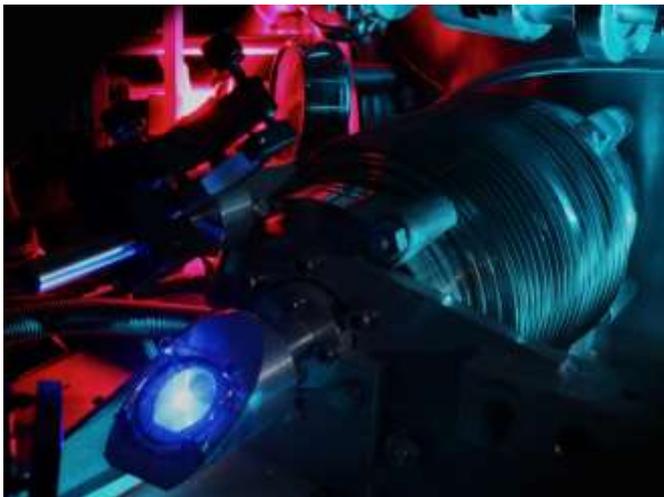
Within the project's scope there were more than 10 visits of Russian researchers to Germany, including internships for students and postgraduates.

Co-authored 4 scientific articles in leading peer-reviewed journals: *Hyperfine Interactions*; *Annalen der Physik*; *Journal of Physics B: Atomic, Molecular and Optical Physics*.



P.N. Lebedev
Physical Institute

Precision one-photon spectroscopy of $2S$ - nP states in hydrogen atom

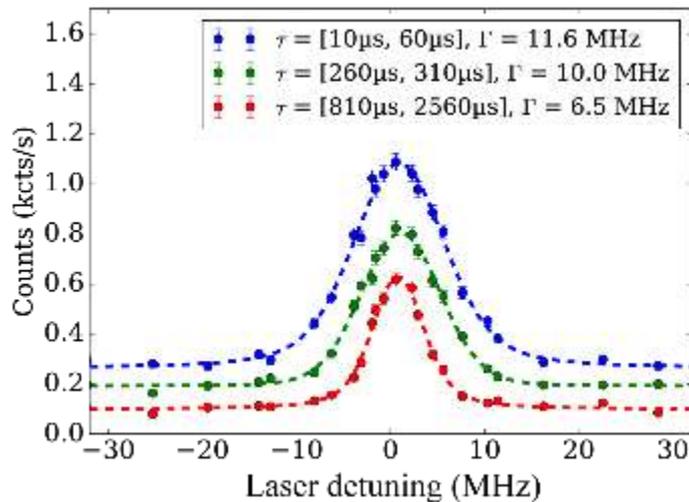


The results were presented at leading international conferences.
(ICOLS, EFTF, CLEO, ICQ)

The joint Russian-German project of Lebedev Physical Institute (N.N. Kolachevsky, Moscow) and Ludwig Maximillan Universitat (T.W. Hansch, Munich).

The joint group and results

2S-6P: Observed line width

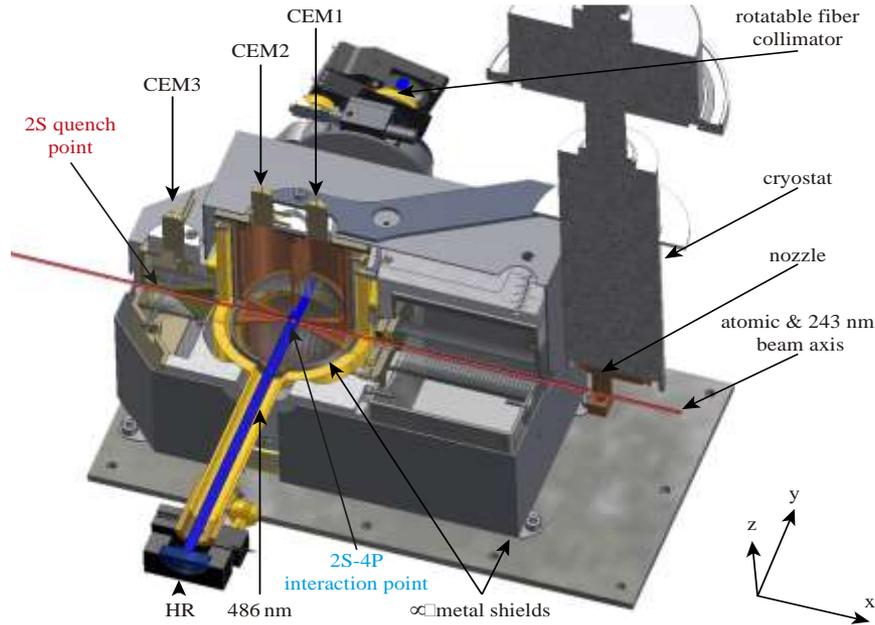


L. Maisenbacher, N.N. Kolachevsky, R. Pohl, Th. Udem
(from left to right) analyze new data

The experimental setup has been strongly modified: the uncertainty is less than 2 kHz. All systematics is under control except light shift (still needs analytics).

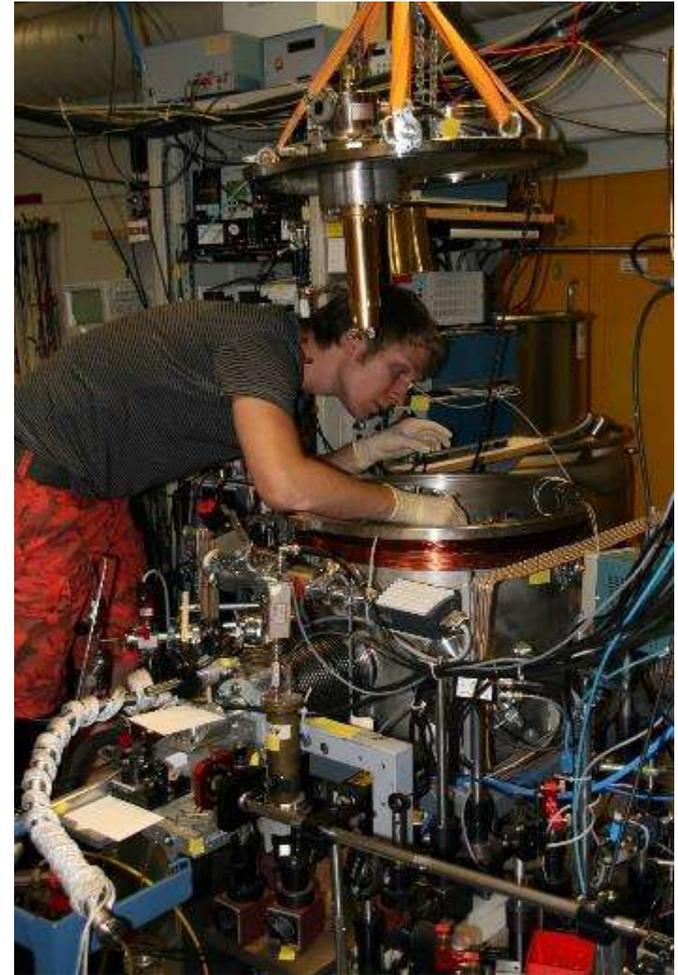
The quantum interference effect from nearby resonances has been completely described. The method allowing control of quantum interference independently from detector geometry has been demonstrated.

Experimental setup



Key features include:

- cryogenic beam of Hydrogen atoms;
- optical excitation of metastable 2S state;
- time-of-flight resolved detection;
- large solid angle detector;
- active suppression of first order Doppler effect.

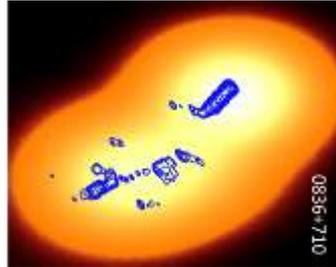
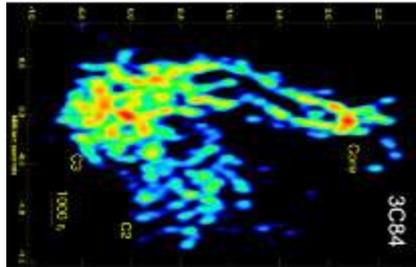


Dr. Axel Beyer adjusts the optical cavity inside vacuum chamber

Record-breaking sharpness in Astronomy

The Russian RadioAstron worked in orbit with a maximum distance of up to 350,000 km. The largest 100-m Radio Telescope in Europe – the German Effelsberg played a crucial role in the success of RadioAstron. Its data was processed on special supercomputers in Moscow and Bonn (so-called correlators).

As a result, images of objects in the Universe are as clear as those of a 350,000 km telescope!

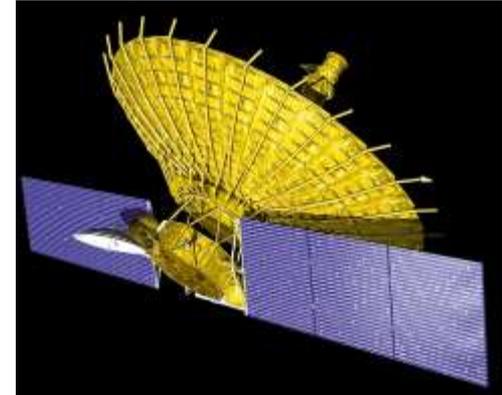


Joined advanced research of The Astro Space Center of the Lebedev Physical Institute of the Russian Academy of Sciences, Moscow, and Max Planck Institute for radio astronomy, Bonn.



Russian Academy of Sciences

Spektr-R/RadioAstron



Effelsberg



MAX-PLANCK-GESELLSCHAFT



Max-Planck-Institut für Radioastronomie



DEUTSCH-RUSSISCHES JAHR
DER HOCHSCHULKOOPERATION
UND WISSENSCHAFT
РОССИЙСКО-ГЕРМАНСКИЙ ГОД
НАУЧНО-ОБРАЗОВАТЕЛЬНЫХ
ПАРТНЕРСТВ



The Schmidt Institute of Physics of the Earth of the Russian Academy of Sciences (IPE RAS) cooperate together with the Ludwig - Maximilians University of Munich within the framework of the RNF grant No. 19-47-04110 on the topic “Behavior of the Earth's magnetic field during superchrons: comparative characteristics of the geomagnetic field of Cretaceous and meso-Neoproterozoic (May) superchrons recorded in volcanic flows of the Okhotsk-Chukotka volcanic belt (North-East of Russia) and in sedimentary rocks of the Yenisei ridge (South Siberian platform)”. IPE RAS conducts paleomagnetic studies of the Okhotsk-Chukotka volcanic belt. The timing of the project: 2019-2021 years.

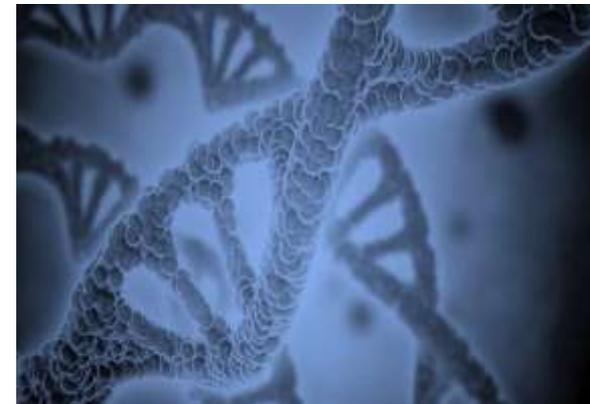
The Omsk Agrarian Research Center and the German Seed Alliance have a mutual cooperation and joint testing of experimental samples of cereals and oilseeds in the experimental fields of the Center.

A cooperation agreement for testing spring rapeseed in various soil and climate zones of the Omsk region was signed for 2019-2021.



The Ernst Federal Research Center for Animal Husbandry (Russia) has cooperation with the Friedrich Loeffler Institute and the Institute of Farm Animal Genetics (Germany). Within the context of the cooperation Russian scientists can realize their training in Germany.

Also The Ernst Federal Research Center for Animal Husbandry carries out the scientific cooperation with Agrobiogen GMBH and plans to start joint research projects with the Institute of Genome Biology of Leibniz Institute for Farm Animal Biology (Germany).



The Department of Medical Sciences of the Russian Academy of Sciences and a number of Russian Research Centers and Universities, in particular Lomonosov Moscow State University, Sechenov University, Immanuel Kant Baltic Federal University, are working together with the Leipzig University, the Charité's BIH Center for Regenerative Therapies on the development of cell technologies.

In February 2020, the Russian-German platform for medical science and healthcare was created. The joint work is already underway in various areas of medical science and practical healthcare.

In 2006, with the support of the President of the Russian Federation V.V. Putin and German Chancellor Angela Merkel, the Forum named after R. Koch and I.I. Mechnikov was established. During 2019, with the support of the Forum, more than 20 specialists from Russia were trained in various clinics in Germany (for 10-20 days).



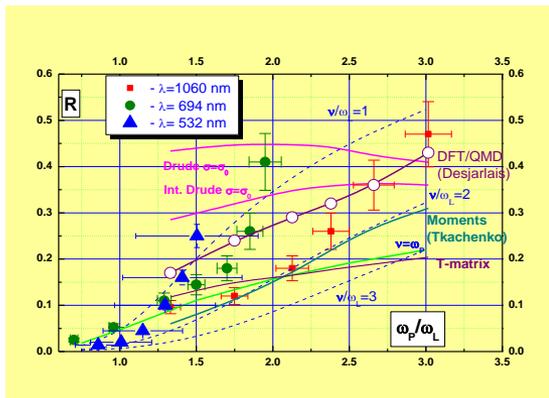
KOCH-METSCHNIKOW-FORUM



МЕЧНИКОВ-КОХ-ФОРУМ

Institute of Problems of Chemical Physics RAS - Joint Institute for High Temperatures RAS - University of Rostock were conducted studies of the interaction of low-intensity laser radiation with dense plasma generated by explosion.

The results are published in the Physical Review: Y. Zaporozhets, V. Mintsev, V. Fortov, H. Reinholz, G. Röpke, S. Rosmej, Y.A. Omarbakiyeva. Polarized angular-dependent reflectivity and density-dependent profiles of shock-compressed xenon plasmas.



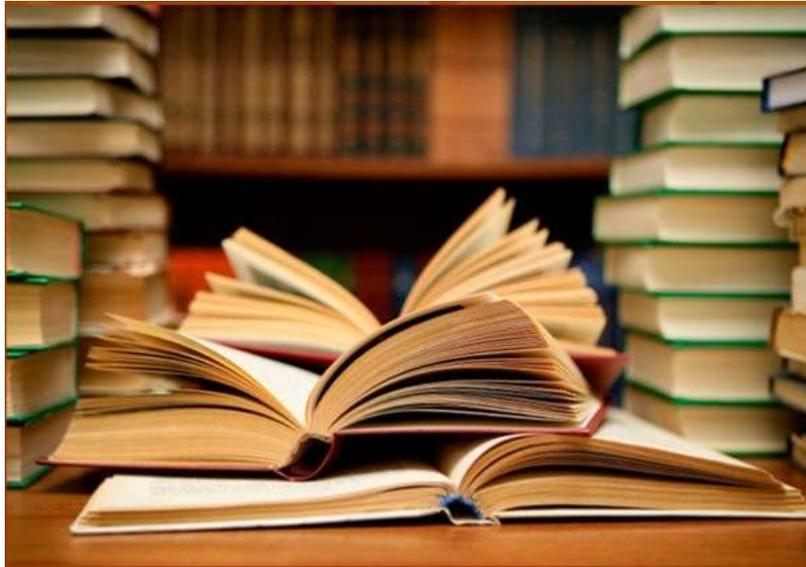
Interaction of Explosively driven dense plasma with a low intensity laser radiation



The pulsed laser system



Investigation of polarized reflectivities of explosively driven dense plasma



Federal Center of Theoretical and Applied Sociology of the Russian Academy of Sciences (FCTAS RAS) together with the Friedrich Ebert Foundation (Germany) are implementing a joint Project - the publication of a collective monograph “Capitals and regions in modern Russia: myths and reality fifteen years later”; the research Project “Claiming the public space: Urban interventions and the shift from vertical to horizontal urban planning”.

The Institute of Philosophy, Russian Academy of Sciences (RAS Institute of Philosophy) has a cooperation Agreement with the Augsburg University (Germany).

The State Public Scientific Technological Library
of the Siberian branch of the Russian Academy of Sciences



The State Public Scientific Technological Library SB RAS in cooperation with The Berlin State Library, The German National Library of Science and Technology (TIB), The Göttingen State and University Library, and The International Youth Library (Munich, Germany) held the annual International Conference on displaced cultural values "The Fate of library collections after the Second World War" as part of the Russian-German library dialogue, the International Scientific and Practical Conference "Libway", and a panel discussion at the scientific seminar "Peoples of Siberia between preserving traditions and breaking into modernity», International online workshop on children's reading "Bibliosphere: new formats".



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