

Stimulating Semiconductor Design Cooperation between Europe and Russia

Newsletter N°1, June 2010



Giles BRANDON
(Intelligentsia Consultants Ltd.) (St Petersburg state Polytechnic University)
Project coordinator



Alexander KOROTKOV
(St Petersburg state Polytechnic University)
Russian scientific leader



Johann Hauer
(Fraunhofer IIS)
European scientific leader

Dear Readers,

We would like to welcome you to the first newsletter of the SEMIDEC project!

SEMIDEC aims to stimulate cooperation in the design of semiconductor components and electronic based miniaturised systems between Europe and Russia. The project started in December 2009 and will run for two years. It is being implemented by a close knit team of six European and Russian organisations.

Over the course of the project, the SEMIDEC team will undertake several key tasks:

- (i) map Russian organisations involved in research relevant to the semiconductor design priorities under the European Commission's FP7 ICT programme
- (ii) organise combined awareness-raising, networking and training events in Russia relating to the semiconductor design research priorities under the European Commission's FP7 ICT programme;
- (iii) support the attendance of Russian experts at key semiconductor design events in Europe;
- (iv) assist Russian organisations to join European consortia preparing proposals about semiconductor design research for the European Commission's FP7 ICT programme;
- (v) support Russian researchers seeking secondments with European semiconductor organisations.

In this newsletter, we provide important news of interesting opportunities for Russian and European researchers to develop cooperation in semiconductor design research.

We hope to meet you during our forthcoming SEMIDEC events.

Happy reading!



The project is supported by the European Commission under the ICT
Thematic area of the 7th Research Framework Programme



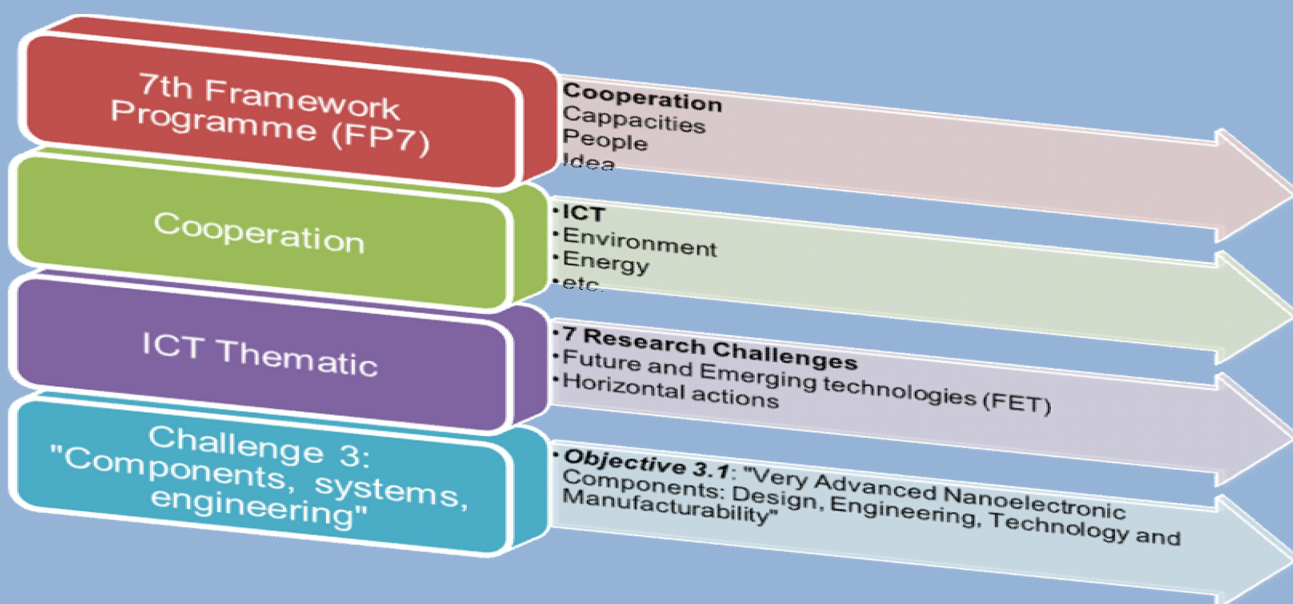


What are the European Commission's semiconductor design research priorities?

Before detailing the **European Commission's (EC) semiconductor design research priorities**, it is important to provide some words of explanation about the EC's **Seventh Framework Programme** for research and technological development (**FP7**) and the **Information and Communication Technologies (ICT)** programme.

FP7 is the EC's chief instrument for funding research over the period 2007 to 2013 with an overall budget of 53.2 billion euro. The broad objectives of FP7 are grouped into four categories: Cooperation, Capacities, Ideas and People.

The category '**Cooperation**' supports all types of research activities carried out by different research bodies in trans-national cooperation and aims to gain or consolidate leadership in key scientific and technology themes such as ICT, Environment, Energy, etc.



In fact, ICT research is the largest funded theme with a total budget of 9.1 billion euro. The ICT theme funding is divided across seven key research challenges. **The third of these challenges is entitled "Alternative Paths to Components and Systems"** and deals with nanoelectronics, photonics, micro- and embedded systems research. Indeed, it is under **Objective 3.1 of Challenge 3** where the EC defines its research priorities for semiconductor design methods and tools, namely:

- Architectures including energy efficiency, spin devices; silicon with molecular switches; ferromagnetic logic; heterogeneous and morphic system architectures;
- Circuit design, methodology and tools addressing e.g. power dissipation constraints, SRAM stability; digital-analogue convergence; device variability, model accuracy; reliability and novel functionality;
- Technology addressing e.g. device leakage current, power dissipation, process variability, monolithic as well as 3D integration of Beyond-CMOS and advanced More-than-Moore, co-integration of photon and electron based devices;
- Modelling and simulation: e.g. quantum and atomic scale effects; electro-thermo-mechanical effects, band-to-band tunnelling; drift diffusion effects; variability, modeling for new materials, processes and devices, and higher abstraction level models for cross technology cross IP level simulation;
- Design-technology solutions for energy efficiency, high reliability and robustness including ultra low power techniques and zero-power concepts; thermal aware design, solutions for complex single or multi-technology systems; reuse and standardisation with respect to IPs, design for self-testing, self-healing and self-configuring.

The next FP7 ICT call for proposals – Call 7 – will open in July with a deadline in November 2010.

Do you think you have a novel project idea relevant to the above semiconductor design research priorities? Are you interested in support from the SEMIDEC team to submit a proposal under Call 7? If yes, then please complete the [SEMIDEC Help Form](#).





Overview of the Russian semiconductor sector

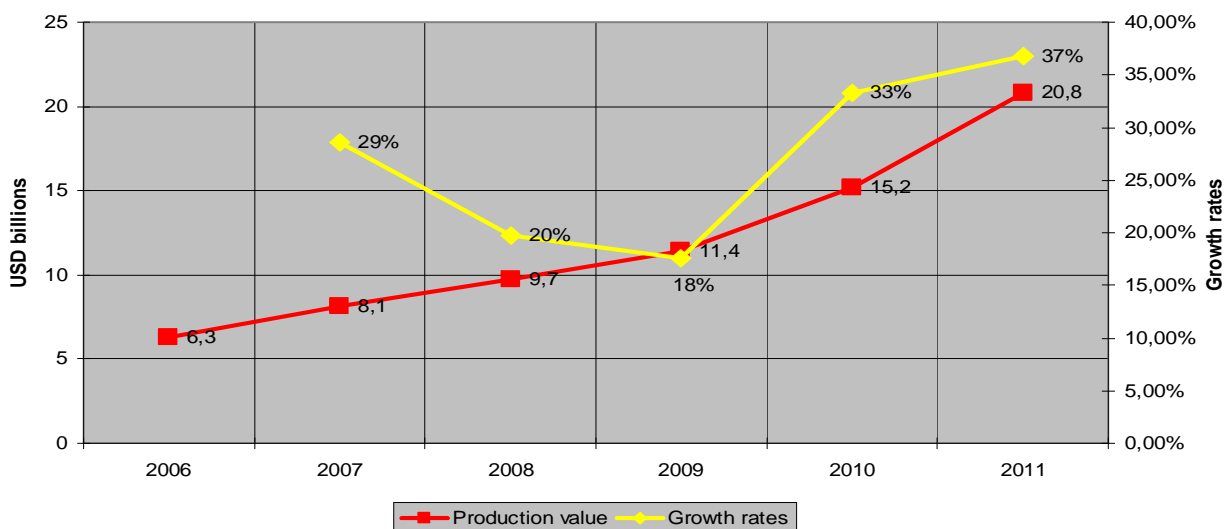
The Russian electronics industry comprises about 200 organizations - 121 industry organization, 18 production organizations, and 61 scientific organizations. Amongst them there are 36 federal state unitary enterprises and 164 open joint stock companies. The main manufactures of integrated circuits are Angstrom JSC and Mikron JSC, which are both based in Zelenograd near Moscow.

Angstrom developed the country's first microprocessor, 4-Kbit DRAM ICs, single-chip microcomputer, 32-bit microprocessor. Today, the company's manufacturing facilities produce 1.5-2.0 μm IC chips on 100 silicon wafers using CMOS, BiCMOS and MOS process technologies; and sub-micron (0.8-1.2 μm) CMOS and BiCMOS LSI and VLSI chips on 150 mm wafers using CMOS and BiCMOS technologies.

Meanwhile, Mikron designs and produces integrated circuits for various devices from electronic games, TV sets and watches to space apparatus, supercomputers and multi-dimension control systems. Mikron produces about 30,000 4" wafers monthly.

Following the collapse of the Soviet Union in 1991, the Russian electronics industry experienced a dramatic decline in investment and domestic demand. Lacking contact with foreign companies and access to foreign markets, many companies struggled to survive.

Today, the Russian electronics market is growing rapidly driven by national multibillion rouble projects in fields such as human healthcare, education, and construction. For example, the market size in 2008 was close to \$10 billion with two thirds dependent upon federal demand and the other third from private consumers.



Market trends for the Russian electronics industry

Also, today, the Russian government places strong emphasis on developing Russia's R&D base in electronics and nanotechnology. For example, the government programme "Development electronic component base and radioelectronics for 2008-2015" aims to create the industrial-technological basis for producing the new generation competitive and knowledge-intensive productions in important technologies such as air and sea transport, automotive transport, engineering and power equipment. The total programme budget is 187 billion roubles (approx 4.1 billion euro).

Furthermore, the government has invested 130 billion roubles (approx 2.9 billion euro) in 2007 to establish the state corporation "RUSNANO". The mission of RUSNANO is to advance Russia to become a world leader in the field of nanotechnologies. The priority of RUSNANO is commercialization of nanotechnology projects with high business potential and/or social benefit.





Stimulating Semiconductor Design Cooperation between Europe and Russia

SEMIDEC kick-off meeting

The official start of the SEMIDEC project was the 1st December 2009 and this was swiftly followed by the SEMIDEC team holding its kick-off meeting at the impressive research centre of team member Fraunhofer Institute for Integrated Circuits (Fraunhofer-IIS) in Erlangen, Germany.

Fraunhofer-IIS is world recognized for its many research activities including microelectronics, telecommunications, audio and multimedia technology, digital radio and digital cinema. Notably, Fraunhofer-IIS is famous for its development of the audio coding technique MP3.



During the kick-off meeting, the SEMIDEC team had an opportunity to plan and prepare in detail the project's activities over the following 12 months.

However, following the well known proverb "*All work and no play makes Jack a dull boy!*", the SEMIDEC team also felt very pleased and privileged to be taken one evening by their kind host to the famous Nürnberger Christkindlmarkt.

DELILA: Successful EU-Russia research collaboration in an EC funded semiconductor design project

DELILA ("*Development of Lithography Technology for Nanoscale Structuring of Materials Using Laser Beam Interference*") is a recently completed 3 year project that involved the Institute of Applied Physics of the Russian Academy of Sciences (IAP) and was funded under the EC's Sixth Framework Programme (FP6).

The main aim of the 2m euro funded project was to research and develop a new production technology for the high resolution fabrication – better than 40nm - of 2D and 3D nanostructures and devices. In particular, DELILA aimed to enable low cost and large volume production of surface structures and patterns with nanometric resolution.

The international project was led by Cardiff University (UK) and involved Tampere University of Technology (Finland), SILIOS Technologies SA (France) and Centro de Estudios e Investigaciones Técnicas de Gipuzkoa (Spain), as well as IAP.

During the project, IAP had lead responsibility for the development of the multiple beam interference lithography technology. And, using the new system, the DELIA team was able to successfully fabricate high resolution nanostructures with feature sizes of ~30nm for direct writing as well as modifications of ~5nm.

For further details about the DELILA project, please visit the project website: <http://www.delila.cf.ac.uk>



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The 17th All-Russian inter-university scientific and technical conference - "Microelectronics and Informatics"



In late April, SEMIDEC partner Moscow Institute of Electronic Technology (MIET) hosted the 17th All-Russian interuniversity scientific and technical conference - "Microelectronics and Informatics" - for students and young researchers.

The conference provided the young scientists a great opportunity to discuss their work and interest in topics such as micro-, opto- and nanoelectronics materials as well as electronic component design and telecommunication systems.

During the event, Dmitry Petryaev (MIET) explained the support offered by the SEMIDEC team to help young Russian researchers to find research internships in Europe. As a result, several researchers completed the SEMIDEC internship questionnaire and their enquiries are being actively followed up by the SEMIDEC team.



Do you want to get involved in EU-Russia collaborative research?

Yes! Then read on and *help us to help you!*

Participate in the first SEMIDEC event in St Petersburg during September 2010

The first SEMIDEC event will coincide with the 8th IEEE East-West Design & Test Symposium (EWDTS) in St Petersburg during 20-21 September 2010.

During the event, the SEMIDEC team will organise:

- Awareness raising of opportunities for cooperative research in semiconductor design under the FP7 ICT
- Networking between Russian and European semiconductor design experts and organisations
- Training on how to contact and cooperate with potential EU semiconductor organisations and how to participate in FP7 ICT

The event will have a particular focus on opportunities for the next FP7 ICT call for proposals – Call 7 – which opens in July and has a deadline in November 2010.

Importantly, the SEMIDEC team will arrange for European semiconductor researchers to participate who are familiar with FP7 ICT and interested to collaborate with Russian researchers.

Would you like to attend the SEMIDEC event in St Petersburg? If yes, then please [register](#).



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Raising European awareness of Russian organisations involved in semiconductor research

Russia is one of a few countries in the world to have in depth knowledge and capabilities spanning research, design and production of microelectronics and integrated circuits. Despite these strengths, European semiconductor organisations have a low awareness of their Russian counterparts. The SEMIDEC team will help to address this issue by mapping Russian organisations involved in semiconductor design research and profiling them in a marketing brochure.

Do you work at a Russian organisation involved in semiconductor design research? Would you like your organisation to be profiled in the SEMIDEC marketing brochure? If yes, then please complete and send our [questionnaire](#) to [Anton Yanovsky](#).

Supporting young Russian researchers to find research internships in Europe

The SEMIDEC team has an extensive network of contacts at European semiconductor organisations – private companies, public research organisations and universities. A significant number of organisations are open to having young and well-qualified researchers conduct internships with them.

Are you a young Russian researcher interested in support to find an internship focused on semiconductor research in Europe? If yes, then the SEMIDEC team would like to hear from you and provide assistance. Please complete and send our [questionnaire](#) to [Flavien Massi](#).

Equally, if you work at a semiconductor research organisation based in Europe and are interested in recruiting Russian interns, then please let us know by contacting [Flavien Massi](#).

Supporting experienced Russian researchers to attend European semiconductor events

For a limited number of experienced Russian researchers, the SEMIDEC project can provide travel grants to attend the following top rated European semiconductor research events:

ESSCIRC, 13-17 Sept 2010, Sevilla, Spain, <http://www.esscirc2010.org/esscirc.html>

The ESSCIRC conference is one of Europe's leading forums where recent advances in solid-state circuits are presented and discussed.

SEMICON Europa, 19-21 Oct 2010, Dresden, Germany, <http://www.semiconeuropa.org/index.htm>

SEMICON Europa is the industry's leading European forum for addressing the challenges facing today's global semiconductor industry.

Are you an experienced Russian researcher interested in attending one of these events? If yes, then please complete and send our [questionnaire](#) to [Anton Yanovsky](#) before 30 June 2010.

Contact from our readers

Are you looking for partners for a research proposal? Do you have experience you would like to share? Do you have a semiconductor research related seminar, conference or publication you would like to promote? If so, please send information to:

Intelligentsia Consultants Ltd (Luxembourg): [Flavien Massi](#)

Russian Technology Transfer Network (Russia): [Anton Yanovsky](#)

For further, up-to-date information concerning SEMIDEC news and events, we encourage you to regularly visit our project website: www.semidec-ru.eu

