

A.M. Prokhorov General Physics Institute of
Russian Academy of Sciences

Nanomaterials Spectroscopy Laboratory

Dr. Elena Obraztsova

elobr@kapella.gpi.ru

Interaction with European Partners
in frames of STREP project 256002 "**ABORIGINAL**"

"Active radio frequency Ids using printed carbon nanotube technology",

submitted in September 2009.

II stage

History of collaboration of

the Nanomaterials Spectroscopy Laboratory (GPI RAS)

with european groups

INTAS – 237

2001-2003

Motivation:

the personal contacts
between scientists



***“Nanocarbons as
building blocks for new materials”***

Coordinator – Prof. Hans Kuzmany
(Wien Technical Universitet, Austria)

***Participants: Wien (Austria), Stuttgart (Germany),
Novosibirsk, Moscow, Kharkov, Troitsk)***





INTAS – 254

2003-2005



*“Novel nanocomposites of nanocarbon:
synthesis, characterization,
applications”*

Motivation:

the personal contacts
between scientists

Coordinator – Prof. Yury Svirko

(University of Joensuu, Finland)

Participants

Joensuu (Finland), Lausanne (EPFL)
(Switzerland), Novosibirsk, Moscow, Izhevsk)



INTAS – 7871

2006-2009



“BORON NITRIDE SINGLE-WALL NANOTUBES: SYNTHESIS, PROPERTIES, POTENTIAL APPLICATIONS”

Motivation:

the personal contacts
between scientists

Coordinator – Dr. Annick Loiseau

(ONERA, Shatillon, France)

Participants

ONERA (France), University of Nantes
(France), Fraunhofer Institute (Dresden,
Germany), Novosibirsk, Moscow,
Chernogolovka)



Motivation:

prolongation of the previous scientific contacts in frames of European projects

France: PICS –RFBR project (2009-2011) (Shatillon, Montpellier)
Cotutelle – a joint Ph.D. student (Lyon University-GPI RAS)
Young scientist INTAS Project (ONERA, Palaseau)
Bilateral Russian-French workshop on Nanotechnologies (Dec, 2008, Moscow)

Finland: Finnish Academy of Sciences – RFBR joint project (Joensuu)
Summer school oh Nanocarbon Photonics and Optoelectronics
(August, 2008, Joensuu, Finland) <http://www.aspbs.com/jno/> v.4 (2009)201-289

Joint FP6-STREP project 033350

“BNC tubes” (2007-2010)

(Coordinator – Prof. Esko Kauppinen,
Technical University of Helsinki)





A new type of motivation:

searching for the partners possessing the unique skills and technologies at the highest world level!

Possible with help of Gate2RuBIN

Contact with the un-known european partners

Introduction in the highest level European teams



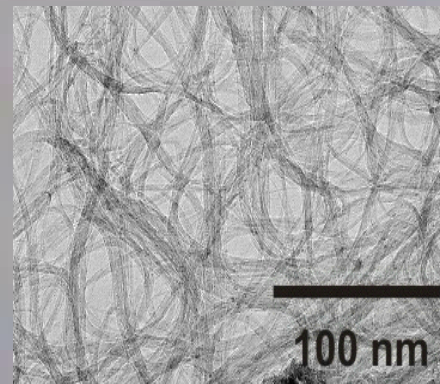
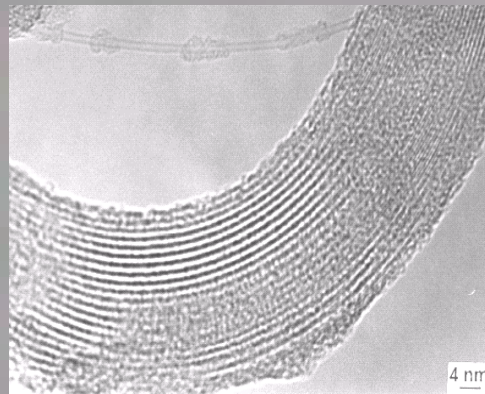
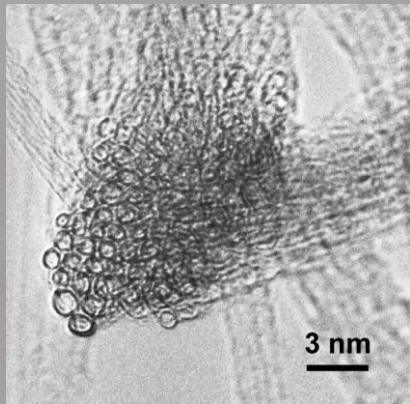
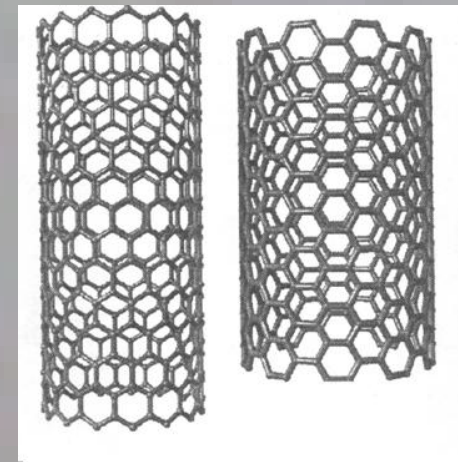
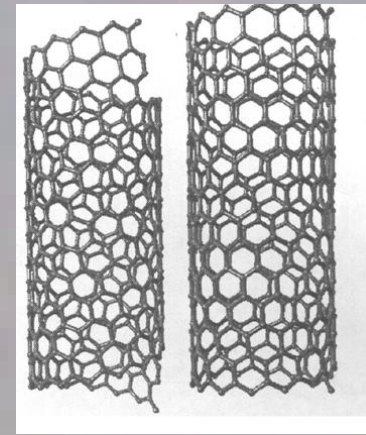
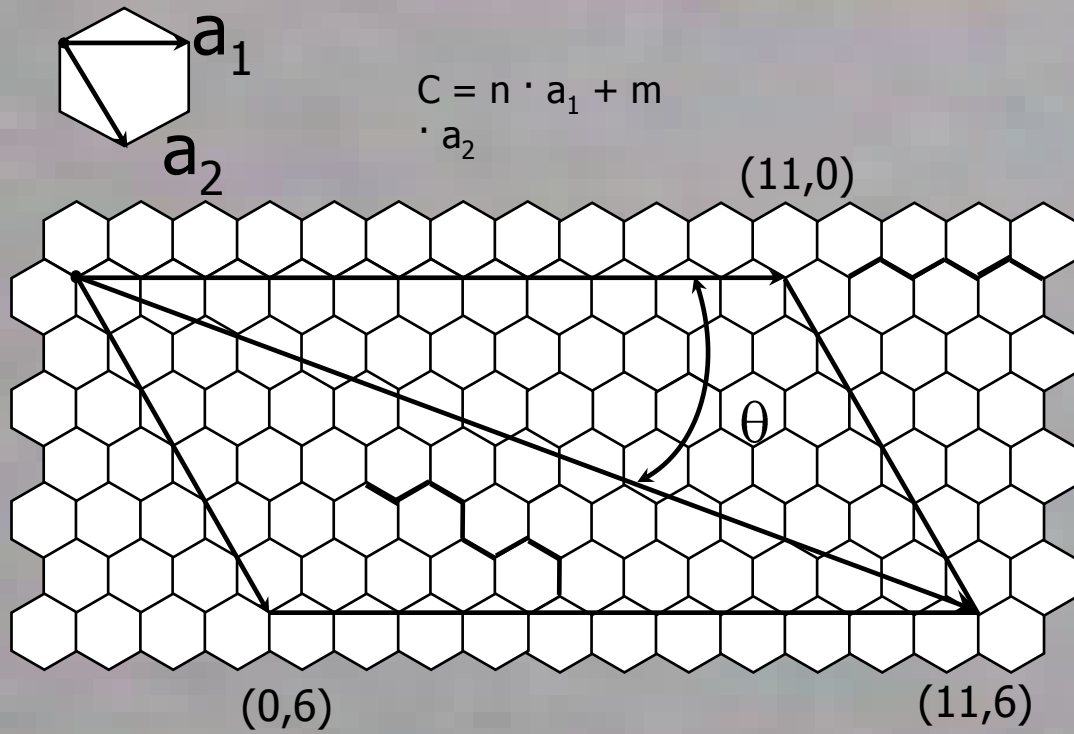
Our new STREP project 256002 "**ABORIGINAL**"

"Active radio frequency Ids using printed carbon nanotube technology",

submitted in September 2009

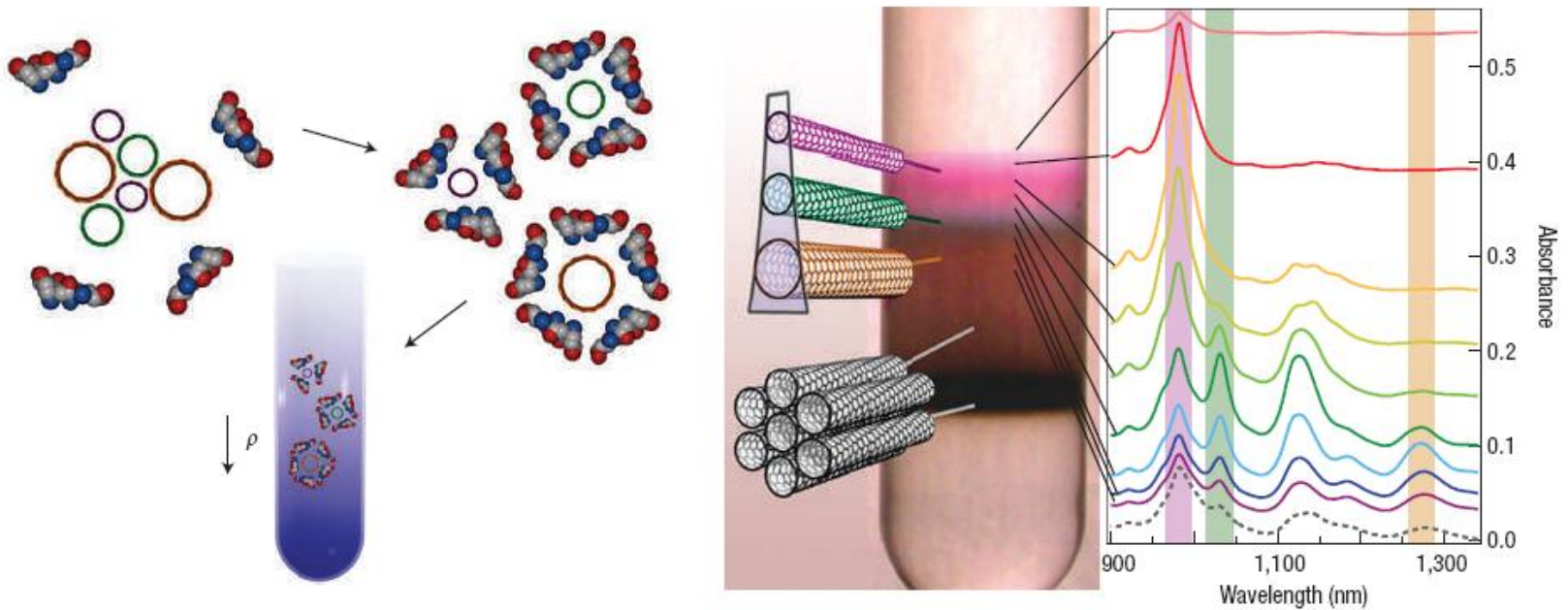
(II stage- deadline in January 2010).

Task: formation of fractions of single-wall carbon nanotubes
with the pure semiconducting properties
for the **printed electronics**.



SINGLE-WALL CARBON NANOTUBES

Gradient ultracentrifugation – a way to obtain the nanotube fractions with a narrow diameter distribution or **metallic** and **semiconducting** fractions

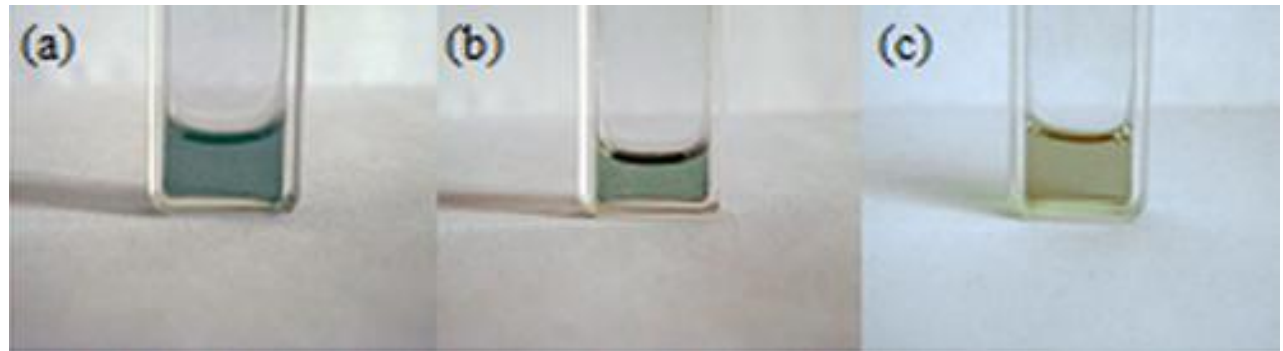


**M. S. Arnold, A. A. Green, M. C. Hersam et al.,
Nature Nanotechnology 1, 60-65 (2006).**

“Colored” nanotube fractions With the diameter distribution < 0.1 nm

A.I. Chernov, E.D. Obraztsova,
Phys. Stat. Solidi B 2009
(in press)

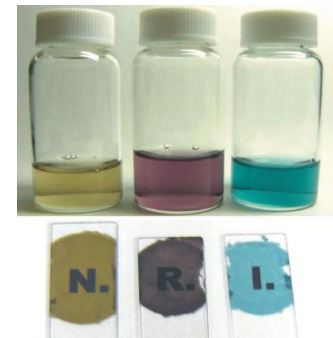
A.I. Chernov, E.D. Obraztsova,
Journ. Of Nanoelectronics and
Optoelectronics , 4(2009) 224.

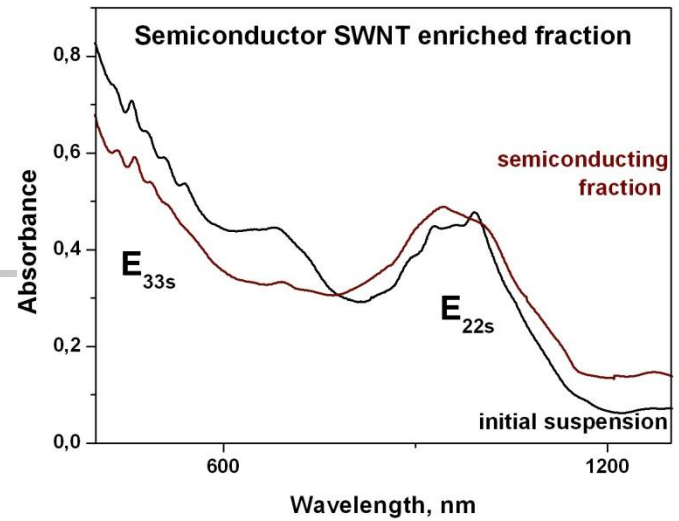
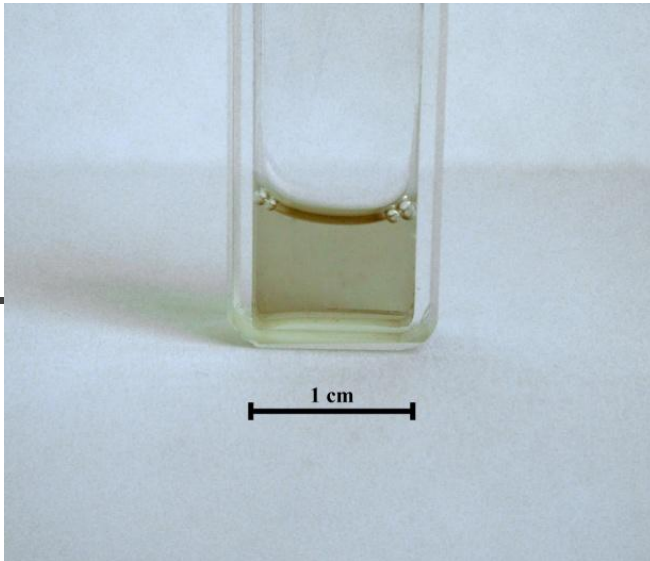


Published data

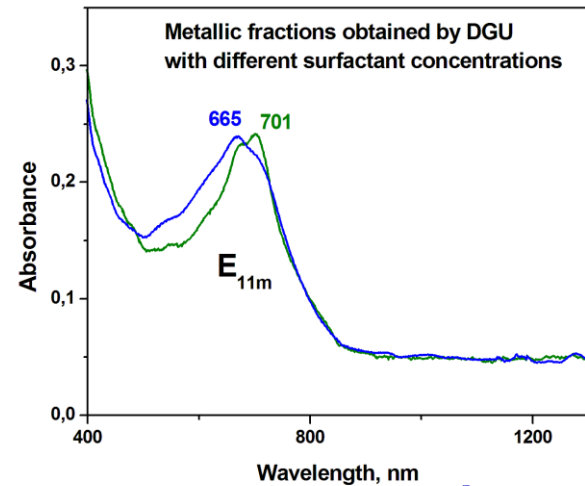
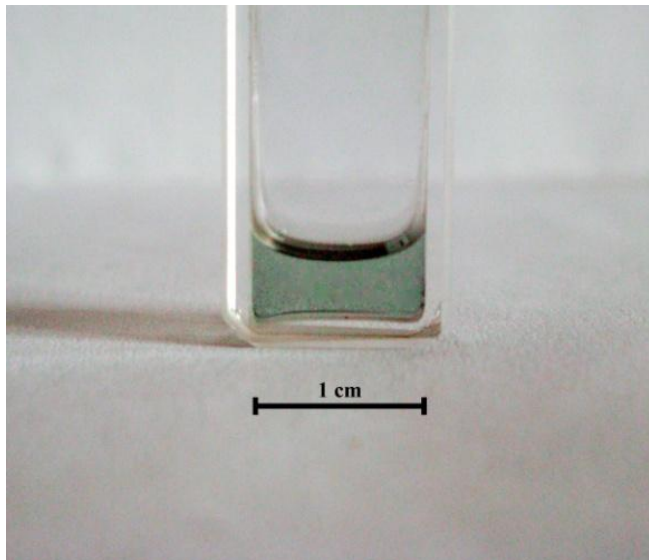
K.Yanagi, Y. Miyata, and H. Kataura,
Appl. Phys. Express 1(2008) 034003.

A. Green, M. Hersam, NanoLetters 8 (2008) 1417





Semiconducting nanotubes
 (> 95%)



Metallic nanotubes (> 97%)



Many thanks for your attention!