



## Group presentation

Silvia Lombardi

NiPS Laboratory, Università di Perugia, Italy

## Members

### Researchers

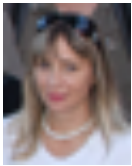
Luca Gammaitoni,  
Full Prof



Helios Vocca, RU



Cristina Diamantini, RU



Francesco Cottone, RTD



Maurizio Mattarelli, RTD



Flavio Travasso, postdoc



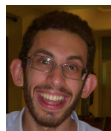
Igor Neri,  
postdoc



Miquel López Suárez,  
postdoc



Davide Chiuchiù,  
PhD



Francesco Orfei,  
PhD



Marzia Colombini,  
postdoc



Silvia Lombardi,  
project manager



Valbona Ramci,  
research assistant

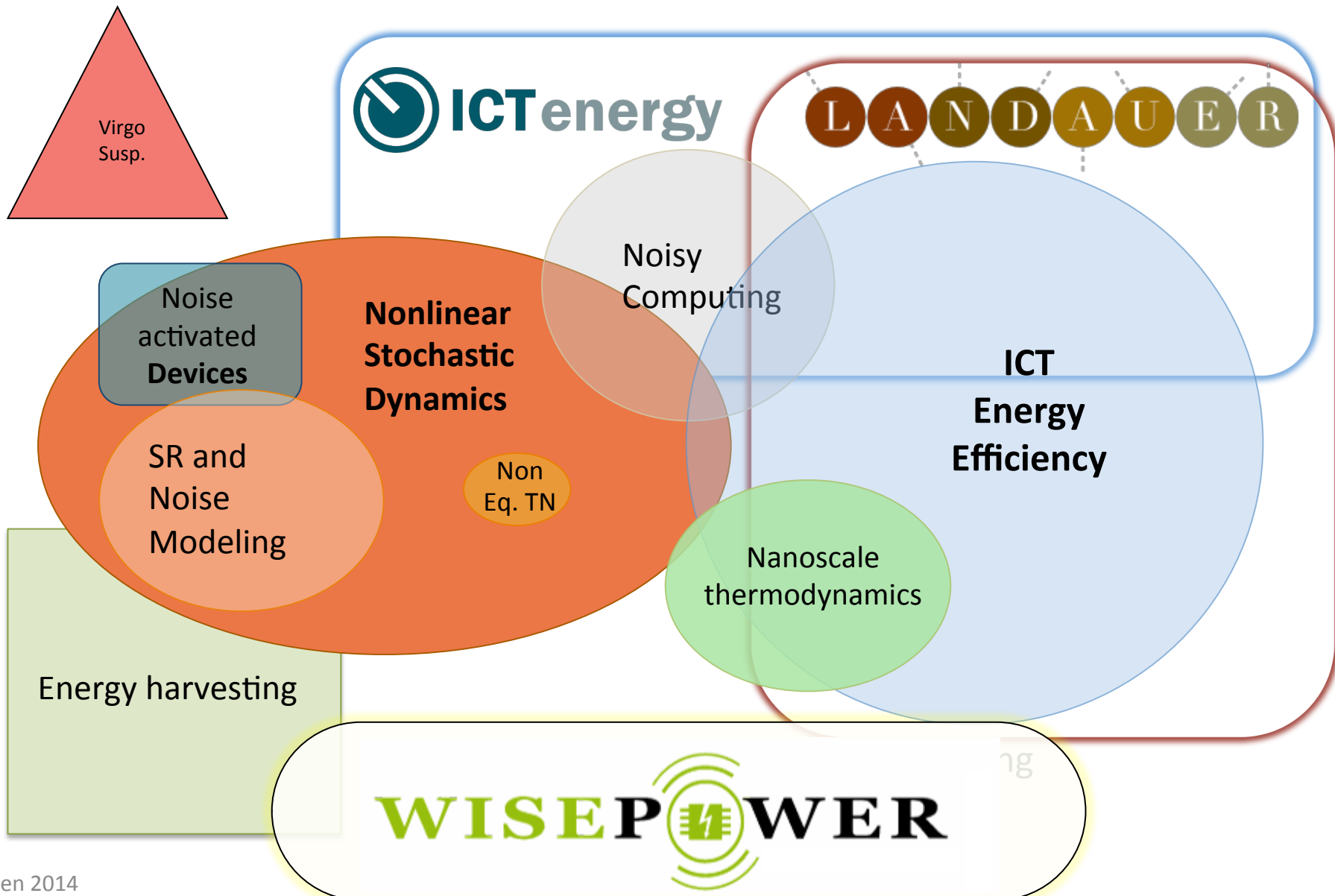


### Staff

+ students + technicians

[www.nipslab.org](http://www.nipslab.org)

# What are we doing? (2014)



# Funded projects

NANOPOWER

(EC FET Proactive 2010-2013)

ZEROPOWER

(EC FET Proactive 2011-2013) Coordination Action

LANDAUER

(EC FET Proactive 2012-2015)

ICT-Energy

(EC FET Proactive 2013-2016) Coordination action

ENERGY HARVESTING MOBILE

(ONRG - US NAVY 2011-2014)

ENERGY HARVESTING PRIN

(National Project)

VIRGO

(INFN)

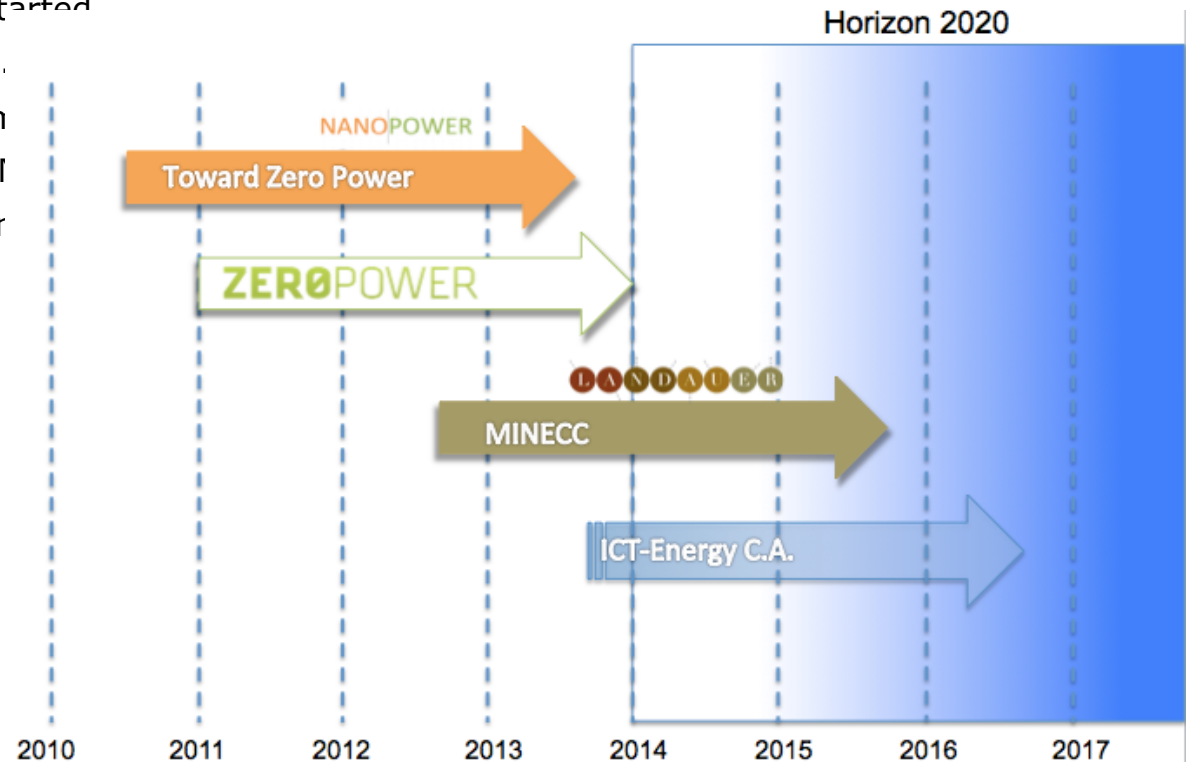
SEM/3 MICROSCOPE

(FONDAZIONE CRPG)



## This is part of an ongoing effort at European level within the FET scheme

- Jan 2008, Expert Consult. on "Molecular-scale Information Systems"
- July 2009, **FP7 CALL 5**, ICT-2009-5 - ICT 2009.8.6 Towards Zero-Power ICT
- Feb 2010, Expert Consult on "Disruptive Solutions for Energy Efficient ICT"
- Aug.1<sup>st</sup> 2010 three project started (SiNAPS, GREEN SILICON, NANOPOWER)
- Jan 1<sup>st</sup> 2011 ZEROPOWER C.A. started
- 26 July 2011 **FP7 CALL 8**, ICT 9.
- 12 Oct 2011 FET Proactive Inform
- 1 Sept 2012 Starting of the 7 MII
- 1 Oct 2013 Starting of the ICT-Er





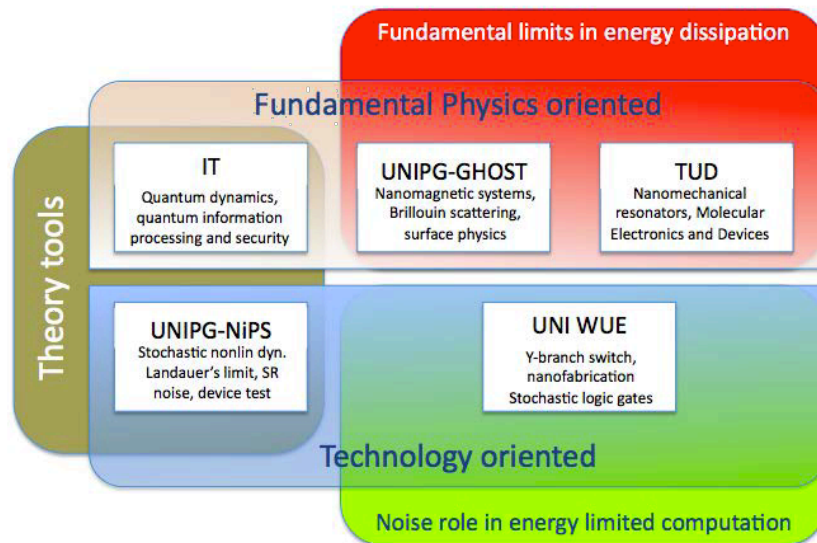
# The MINECC initiative

Minimizing Energy Consumption of Computing to the limit - FET Proactive



- UNIVERSITA DEGLI STUDI DI PERUGIA, ITALY (UNIPG-NiPS, UNIPG-Ghost)
- JULIUS-MAXIMILIANS UNIVERSITAET WUERZBURG, GERMANY
- INSTITUTO DE TELECOMUNICACOES, PORTUGAL
- TECHNISCHE UNIVERSITEIT DELFT, NETHERLANDS

Operating ICT basic switches below the Landauer limit

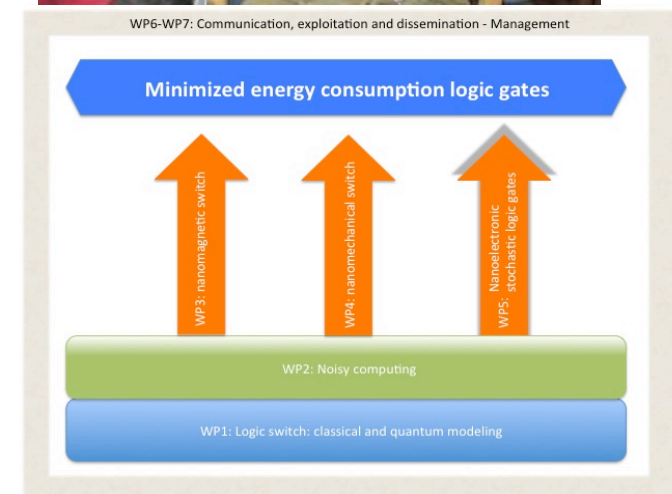


**scientific objective** → to test the fundamental limits in energy dissipation during the operation of physical switches

**technological objective** → to introduce new conceptual devices that are capable of trading the minimum amount of energy dissipated with the computational precision



WP6-WP7: Communication, exploitation and dissemination - Management



# Educational activities

Aug. 1-8  
2010

**Summer School and  
International Workshop**

**NiPS Summer School**

Energy Har  
Noise in dy

**NiPS** La  
Noise in Physic

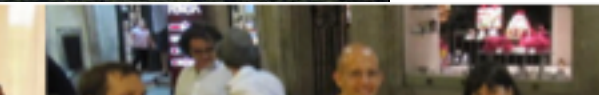
**Aviglian**



**Perugia - A**



**Erice – Lu**



**Perugia - Jul 2013**

**Energy management at micro and nanoscales**



# NANOENERGY2013



Perugia 10-13 July, 2013

([www.nanoenergy2013.eu](http://www.nanoenergy2013.eu))



**ZEROPOWER**

**WISEPOWER**

**NANOPOWER**

**LANDAUER**



# Educational activities – NiPS Summer School 2014

2014 ICT-Energy: Energy management at micro and nanoscales for future ICT  
Perugia (IT) – July 14-18, 2014

**3 specialized schools (ICT-Energy-LANDAUER-PHIDIAS)**

## General Program

### July 14, Mon. DAY 1

15.00 - 16.00 Registration  
16.00 - 16.30 Presentation of the school  
16.30 - 18.30 2 Lectures --> General session  
18.30 - 19.00 Welcome cocktail  
Evening free

### July 15, Tue. DAY 2

9.00 - 13.00 2 Lectures --> General session  
13.00 - 14.00 Lunch  
15.00 - 18.00 2 Lectures --> General session  
Evening free

### July 16, Wed. DAY 3

9.00 - 12.30 2 Lectures --> General session  
12.30 - 13.30 Lunch  
14.00 - 23.00 Excursion and social dinner

### July 17, Thu. DAY 4

9.00 - 13.00 2 Lectures --> Parallel Project sessions: ICT-Energy + LANDAUER + PHIDIAS  
13.00 - 14.00 Lunch  
14.00 - 15.30 Poster session & Coffee  
15.30 - 18.30 2 Lectures --> Parallel Project sessions: ICT-Energy + LANDAUER + PHIDIAS  
Evening free

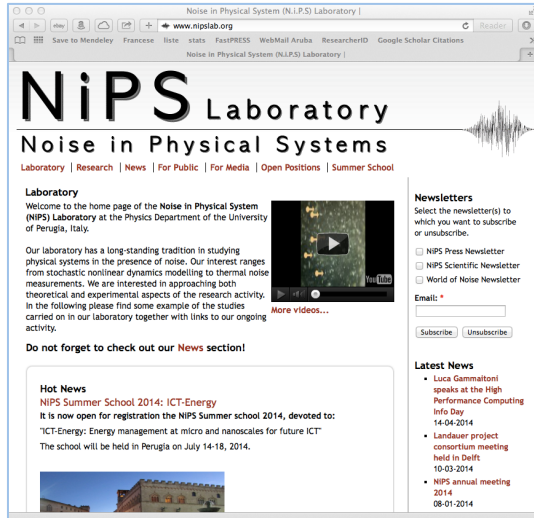
### July 18, Fri. DAY 5

9.00 - 13.00 2 Lectures --> Parallel Project sessions: ICT-Energy + LANDAUER + PHIDIAS  
13.00 - 14.00 Lunch  
15.00 - 18.00 2 Lectures --> Parallel Project sessions: ICT-Energy + LANDAUER + PHIDIAS  
20.00 end of the school



[www.nipslab.org/summerschool2014](http://www.nipslab.org/summerschool2014)

# Outreach activities

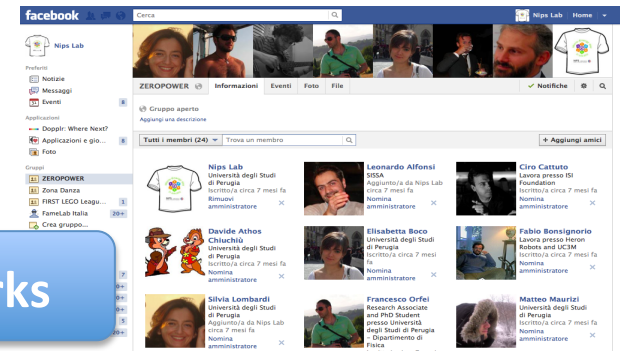


[www.nipslab.org](http://www.nipslab.org)

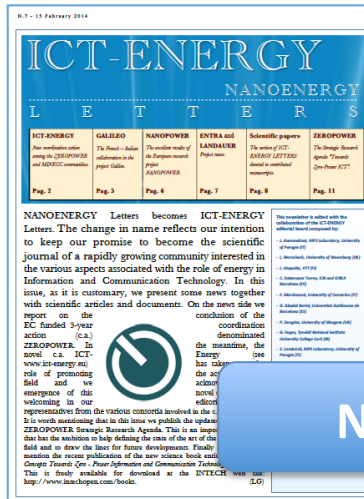


ICT-Energy group

Social networks



**zero-power**  
@zeropower0  
<http://www.zero-power.eu>



Newsletter



Micro-Energy Day



Exhibits



a spin-off company of NiPS Laboratory  
at the University of Perugia, Italy

[www.wisepower.it](http://www.wisepower.it)



Arcadia, California (USA)



# Educational activities – NiPS Summer School

2010



Summer School "Energy Harvesting at micro and nanoscale"  
Workshop "Energy management at micro and nanoscale"  
Perugia (IT), Aug. 1-6, 2011



2011



2012



23-27 July 2012  
Erice (Sicily - IT)

2013

**Summer School "Energy management at micro and nanoscales"**

Perugia (IT), July 8-10, 2013

[www.nipslab.org/summerschool](http://www.nipslab.org/summerschool)

