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14. ABSTRACT It is a common view among the leading professionals in microelectronics is that its current explosive development will likely lead to profound paradigm shifts in the near future. Identifying the plausible scenarios for the future evolution of microelectronics presents a tremendous opportunity for constructive action today. The main purpose of our Workshop is to provide forum for a free-spirited exchange of views among the leading professionals in Industry, Academia, and Government. The program included both prepared invited presentations and ad hoc contributions with uninhibited exchange of views and rebuttals. Some of the key luminaries of our profession came					
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## Report Title

Final Report: Advanced Research Workshop on Future Trends in Microelectronics: Journey into the Unknown

### ABSTRACT

It is a common view among the leading professionals in microelectronics is that its current explosive development will likely lead to profound paradigm shifts in the near future. Identifying the plausible scenarios for the future evolution of microelectronics presents a tremendous opportunity for constructive action today. The main purpose of our Workshop is to provide forum for a free-spirited exchange of views among the leading professionals in Industry, Academia, and Government. The program included both prepared invited presentations and ad hoc contributions with uninhibited exchange of views and rebuttals. Some of the key luminaries of our profession came to share their opinions and to lead the discussions on where we are going and/or should be going. Balanced representations of advocacy and opposition where intentionally sought.

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**(a) Papers published in peer-reviewed journals (N/A for none)**

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Paper

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**Number of Papers published in non peer-reviewed journals:**

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Number of Presentations: 0.00

**Non Peer-Reviewed Conference Proceeding publications (other than abstracts):**

Received      Paper

**TOTAL:**

Number of Non Peer-Reviewed Conference Proceeding publications (other than abstracts):

**Peer-Reviewed Conference Proceeding publications (other than abstracts):**

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**TOTAL:**

Number of Peer-Reviewed Conference Proceeding publications (other than abstracts):

**(d) Manuscripts**

Received      Paper

**TOTAL:**

Number of Manuscripts:

**Books**

Received      Book

**TOTAL:**

TOTAL:

Patents Submitted

Patents Awarded

Awards

Graduate Students

<u>NAME</u>	<u>PERCENT SUPPORTED</u>
FTE Equivalent:	
Total Number:	

Names of Post Doctorates

<u>NAME</u>	<u>PERCENT SUPPORTED</u>
FTE Equivalent:	
Total Number:	

Names of Faculty Supported

<u>NAME</u>	<u>PERCENT SUPPORTED</u>
FTE Equivalent:	
Total Number:	

Names of Under Graduate students supported

<u>NAME</u>	<u>PERCENT SUPPORTED</u>
FTE Equivalent:	
Total Number:	

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The number of undergraduates funded by this agreement who graduated during this period: ..... 0.00

The number of undergraduates funded by this agreement who graduated during this period with a degree in science, mathematics, engineering, or technology fields:..... 0.00

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### Names of Personnel receiving masters degrees

NAME

**Total Number:**

### Names of personnel receiving PHDs

NAME

**Total Number:**

### Names of other research staff

NAME

PERCENT SUPPORTED

**FTE Equivalent:**

**Total Number:**

### Sub Contractors (DD882)

### Inventions (DD882)

### Scientific Progress

### Technology Transfer

# 2015 Advanced Research Workshop Future Trends in Microelectronics: Journey into the Unknown

## Summary Technical Report

Additional detailed information about the workshop, the complete list of participants and their affiliation, the full program and abstracts of each and every presentation, etc. can be found on Workshop's website <http://www.ece.stonybrook.edu/~serge/ARW-8/home.html>. Links to specific pages of this website will be cited below as needed.

- **Location and Dates**

The Workshop was held on the island of Mallorca, Spain. The venue was in the [Eurotel Punta Rotja](#), located on the north-eastern coast of [Mallorca](#). We met for five working days, June 21-26, 2015. For information related to travel and logistics of the workshop see the travel page, <http://www.ece.stonybrook.edu/~serge/ARW-8/travel.html>

- **Organizers** (<http://www.ece.stonybrook.edu/~serge/ARW-8/committees.html>)

Serge Luryi	Co-Chair
Jimmy Xu	Co-Chair
Enrique Calleja	Local Arrangements
Sorin Cristoloveanu	Local Arrangements
Alex Zaslavsky	Treasurer

- **Participants** (<http://www.ece.stonybrook.edu/~serge/ARW-8/participants.html>)

Among the attendees were visionary academics as well as a number of captains of high-tech industry worldwide.

- **General Comments**

Many participants expressed their opinion that the meeting was very successful. My own opinion, as Project Director, is extremely positive. The key factors of success were:

- Excellent speakers and panelists. We were able to attract scientists of highest caliber. One good reason: the timely themes of the conference.
- Excellent location and local organization.
- Adequate financial support from our sponsors.
- High reputation of the meeting.

- **Philosophy and Scope**

It is a common view among the leading professionals in microelectronics is that its current explosive development will likely lead to profound paradigm shifts in the near future. Identifying the plausible scenarios for the future evolution of microelectronics presents a tremendous opportunity for constructive action today. The main purpose of our Workshop is to provide forum for a free-spirited exchange of views among the leading professionals in Industry, Academia, and Government. For an expanded philosophy statement, as well as for the full scope and the list of topics for the discussion, see

<http://www.ece.stonybrook.edu/~serge/ARW-8/philosophy.html>

- **Program**

The program included both prepared invited presentations and *ad hoc* contributions with uninhibited exchange of views and rebuttals. Some of the key luminaries of our profession came to share their opinions and to lead the discussions on where we are going and/or should be going. Balanced representations of advocacy and opposition were intentionally sought. The entire program complete with one-page abstracts of all papers, including both oral and poster contributions can be viewed at

<http://www.ece.stonybrook.edu/~serge/ARW-8/program.html>

- **Format**

Each day of the conference started with presentations given by key speakers on subjects in one or two chosen themes. It was then followed by debates and invited talks by other participants. All oral presentations (in morning sessions) focused on the presenter's views and projections of future directions, assessments or critiques of important new ideas/approaches and NOT on their own achievements. The presenters were asked to be provocative and/or inspiring.

Latest advances made and results obtained by the participants were presented in the afternoon sessions in the form of posters and group/individual discussions.

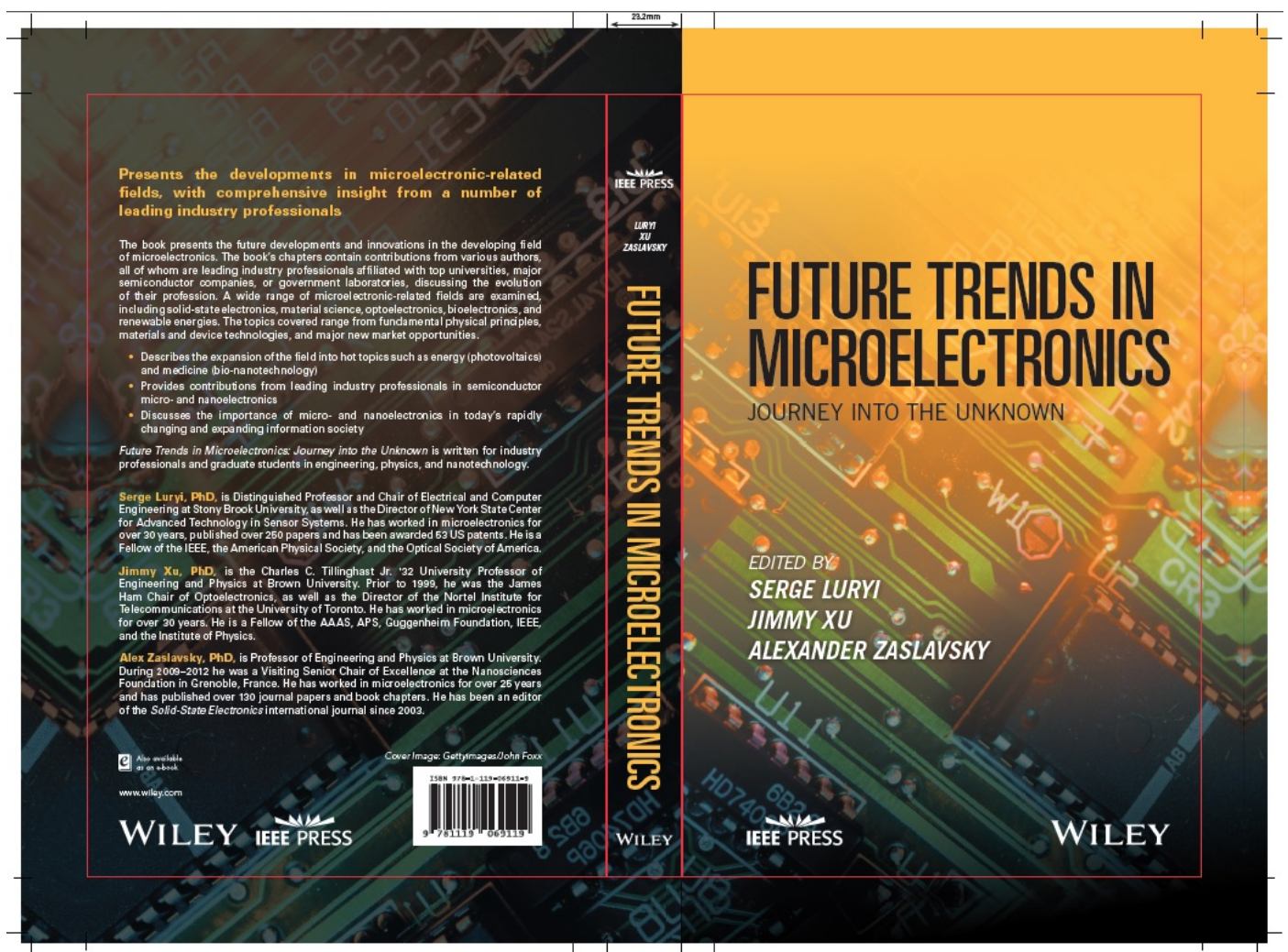
The day was concluded by an evening panels session that aimed at furthering the debates on selected controversial issues connected to the theme of the day. Each session was chaired by one forceful character who invited 2-3 attendees of his/her choice to lead with a position statement, all other attendees being the panelists. The debate was forcefully moderated and irrelevant digressions were cut off.

We have taken a format that is less rigid than normal workshops to allow and encourage uninhibited exchanges and sometimes confrontation of different views. One of the evening panels produced "historical votes and bets on fashionable trends." These votes, pioneered by the Nobelist Horst Stormer, are traditional to FTM workshops, albeit too irreverent to be exposed in a general publication. Another FTM tradition is a general vote on the Best Poster award. This year's award, <http://www.ece.stonybrook.edu/~serge/ARW-8/BestPosterAward-Shur.pdf> went to Professor Michael Shur of Rensselaer Polytechnic Institute, Troy, NY

- **Publication**

Due to the nature of our Workshop, its proceedings volume is published as a collective treatise rather than “conference proceedings”. The distinction is seen not only in the unified format of the book (rather than the usual agglomerate of poorly matched camera-ready manuscripts) but also in its accessible pricing that is aimed at a wide circulation.

To our great delight, Wiley Interscience has remained our publisher for the 8<sup>th</sup> FTM. The collective treatise has been printed and is widely available. All participants and their co-authors received complimentary copies and so will all sponsors of the workshop. The entire volume was submitted to Wiley in Jan 2016 and came out in October 2016 under the name *Future Trends in Microelectronics: Journey into the Unknown* (ISBN: 978-1-119-06911-9).



The abstracts of all presentations, oral or poster, can be viewed from the program webpage, <http://www.ece.stonybrook.edu/~serge/ARW-8/program.html>, by clicking on the title of the presentation of interest.