

Sohrab R. Sani

CONTACT INFORMATION	Electrum 229 229-16414 Kista, Sweden	+46 76-234-9894 sohrabrs@kth.se
RESEARCH INTERESTS	Design, fabrication and characterization of innovative and state of the art devices.	
EDUCATION	KTH Royal Institute of Technology , Stockholm, Sweden	
	Ph.D., Microelectronics and Applied Physics, Jun 2013	
	<ul style="list-style-type: none">• Thesis Topic: <i>Fabrication and Characterization of Nanocontact Spin-Torque Oscillators</i>• Advisors: Johan Åkerman, Professor	
	MSc., Nanoelectronics, Jun 2008	
	<ul style="list-style-type: none">• Topic: <i>Fabrication of ZnO(Nanowire)-GaN diode</i>• Advisor: Professor Johan Åkerman	
	Azad University of Science and research center , Tehran, Iran	
	BSc., Applied Physics, May 2005	
WORK EXPERIENCE	NanOsc AB, Stockholm, Sweden	Jun 2009 to present
	<i>High tech startup in the spintronics/nanotechnology in space</i>	
	Research and processing engineer	
	<ul style="list-style-type: none">• Produced devices (oscillators) with output power 30% higher power than competitor devices with similar characteristics.• Devices worked reliably at current density of 4×10^8 (A/cm²) an order of magnitude higher than the standard.• First report on coherent synchronization of device with more than two nano contacts (My devices showed four synchronized contacts).• Developing standard operation procedures and implementing 60 step run-sheets allowing 100% yield increase.	
	Asfalt-TOUS and Asto, Tehran, Iran	2003 to 2005
	<i>Construction Company and industrial Structure Manufacturing</i>	
	IT Manager	
	<ul style="list-style-type: none">• Network backbone were designed and implemented. That resulted in 35% higher work efficiency in both companies personnel.• Over 300 stationary computers were connected between two different worksites outside of the main internet grid.	
REFEREED JOURNAL PUBLICATIONS	<ol style="list-style-type: none">1. S.R. Sani, J. Persson, A. Dmitriev, M. Käll, and J. Åkerman, “Hole mask colloidal lithography on magnetic multilayers for spin torque applications”, <i>Journal of Physics: Conference Series</i>, vol. 200, no. 7, p. 072078, Jan. 2010.2. S.R. Sani, J. Persson, S.M. Mohseni, V. Fallahi, J.Åkerman, “Current induced cortices in multi nonocontact spin torque devices”, <i>Journal of Applied Physics</i>, vol. 109, no. 7, p. 07C913, 2011 , <i>Vir. J. Nan. Sci. Tech.</i> 23 (14), 18, 2011.3. S.M. Mohseni, S.R. Sani, J. Persson, T. N. Anh Nguyen, S.Chung, Ye. Pogoryelov, and Johan Åkerman, vi. “High frequency of a spin-torque oscillator operation at low field”, <i>Physica Status Solidi RRL</i>, 5, 432 2011.	

4. S. M. Mohseni, **S.R. Sani**, J. Persson, T. N. Anh Nguyen, S. Chung, Ye. Pogoryelov, P.K. Muduli, E. Iacocca, A. Eklund, R.K. Dumas, S. Bonetti, A. Deac, M. Hofer, and Johan Åkerman, “Spin Torque Generated Magnetic Droplet Solitons”, *Science* vol. 339 No. 6125 P 1295 2013
5. **Sohrab Redjai Sani**, Philipp Dürrenfeld, Seyed Majid Mohseni, Sunjae Chung, and Johan Åkerman, “Microwave signal generation in single-layer nano-contact spin torque oscillators”, *IEEE Transactions on Magnetics*.
6. S. M. Mohseni, R. K. Dumas, Y. Fang, J. W. Lau, **S.R. Sani**, J. Persson, and Johan Åkerman, “Temperature dependent interlayer coupling in Ni/Co perpendicular pseudo-spin-valve structures”, *Physical Review B*, 84, 174432 (2011).
7. S.M. Mohseni, R. K. Dumas, Y.Fang, J. W. Lau, **S.R. Sani**, J. Persson, and Johan Åkerman, “Temperature dependent interlayer coupling in Ni/Co perpendicular pseudo-spin-valve structures”, *Physical Review B*, 84, 174432 2011.
8. C. L. Zha, R. K. Dumas, J. W. Lau, S. M. Mohseni, **S.R. Sani**, I. V. Golosovsky, a. F. Monsen, J. Nogues, and J. Åkerman, “Nanostructured MnGa films on Si/SiO₂ with 20.5 kOe room temperature coercivity” *Journal of Applied Physics*, vol. 110, no. 9, p. 093902, 2011.
9. J. Persson, **S.R. Sani**, S. Bonetti, F. Magnusson, Ye. Pogoryelov, S.M. Mohseni, S. Gunnarsson, M. Norling, C. Stoij, and Johan Åkerman, “Spin-torque oscillator in an electromagnet package”, *IEEE Trans. Magn.*, vol. 48, no. 11, pp. 43784381, 2012.
10. Randy K. Dumas, E. Iacocca, S. Bonetti, **S.R. Sani**, S.M. Mohseni, A. Eklund, J. Persson, O. Heinonen, and Johan Åkerman, “Spin wave mode coexistence: A consequence of the Oersted field induced asymmetric energy landscape”, *Phys. Rev. Lett.* vol. 110, Article 257202, 2013 .

SUBMITTED
JOURNAL
PUBLICATIONS

1. **S.R. Sani**, J. Persson, S.M. Mohseni, Ye. Pogoryelov, P. K. Muduli, A. Eklund, G. Malm, A. Dmitriev, M. Käll, and J. Åkerman, “Mutually synchronized bottom-up multi-nano-contact spin torque oscillators to Submitted on Manuscripts”, *Under review in Nature Communications* 2013.

PAPERS IN
PREPARATION

1. **S.R. Sani**, J. Persson, S.M. Mohseni, Philipp Dürrenfeld and Johan Åkerman, “High frequency vortex mode in nano-contact based STO.”
2. **S. R. sani**, J. Persson, S.M. Mohseni, Philipp Dürrenfeld , J.V. Kim and Johan Åkerman, “Mutual synchronization in single layer nano-contact spin torque oscillator.”
3. P. Keatley, **S. R. Sani**, T. Loughran, J. Åkerman, and R. Hickenv “ Time-resolved Kerr imaging of magnetisation dynamics generated by a nano-contact spin transfer vortex oscillator”

CONFERENCES

- Mutually synchronized bottom-up multi-nano-contact spin torque oscillators to Submitted on Manuscripts, Gordon Research Conference(Poster) August 2013
- Microwave signal generation and mutual synchronization in single-layer nano-contact spin torque oscillators MML, (Oral presentation) May 2013
- Microwave signal generation in single-layer nano-contact spin torque oscillators, Joint MMM/Intermag, (Oral presentation) Jan 2013

- Oscillatory spin wave influence on threshold currents in STNO pairs, Nordic Magnetic Conference(Oral presentation) March 2012
- Oscillatory spin wave influence on threshold currents in STNO pairs, MMM Scottsdale, Arizona, USA, (Oral presentation) Jan 2012
- Current induced vortices in multi-nanocontact spin torque devices, MMM Atlanta, USA, (Oral presentation) Jan 2010
- Hole mask colloidal lithography on magnetic multilayers for spin torque application, Nano2009 San Sebastian, Spain(Oral presentation) Oct 2009
- Hole mask colloidal lithography on magnetic multilayers for spin torque application ,ICMFS, Berlin, Germany (Poster) Jul 2009
- Hole mask colloidal lithography on magnetic multilayers for spin torque application, ICM,Karlsruhe, Germany (Oral presentation) Jun 2009

DEVICE
FABRICATION
SKILLS

- **Lithography:** Professional user of, one to one mask aligners and Ultratech XLS i-line stepper,ALS 2035 G-line, and experienced user of nano imprinting, and electron beam lithography systems.
- **Etching:** Highly experienced user of Oxford instrument RIE systems and applied physics P5000, reactive ion etching (RIE) tool. As well as wet etching of variety metals and ICP etching.
- **Deposition:** Thine film deposition of ferromagnetic materials wit AJA sputtering systems. Professional user of thermal and electron beam evaporation systems. experienced user of KDF sputtering system and Ion Beam Sputtering Tool. Plasma enhanced chemical vapor deposition (PECVD) of SiO_2 with Oxford instrument ad applied physics systems . Al_2O_3 deposition with Atomic Layer Deposition (ALD).

MEASUREMENT
TECHNIQUES

- **Processing and thine film:** HR-X-Ray, Alternating Gradient Magnetometer (AGM), Scanning electron microscopy (SEM), Optical profilometer, Ellipsometry and Focused Ion Beam (FIB).
- **Device characterization tools:** RF measurement setup with electromagnet (2.2 Tesla), (spectrum analyzer, oscilloscope, Bias-T, circulators and Current source and etc). Semiautomatic 8 inch Cascade 12000 wafer prober with hot/cold chuck.

COMPUTER SKILLS

- **Data analysis and fitting softwares:** Matlab, Mathematica and OriginLab.
- **Mask design softwers:** Cadence and klayout.
- **Image processing and design softwares:** Adobe Photoshop, Adobe Illustrator and Adobe Indesign CS6.
- **World processing:** Microsoft office and latex.

REFERENCES

Johan Åkerman
Professor
Department of Physics
Goteborg university

Phone: +46 8790 4360
E-mail: johan.akerman@physics.gu.se