

Umit Keles

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Education

Ph.D., Physics 2014	Bilkent University, Ankara, Turkey Dissertation Title: <i>Silicon Nanowire-based Complex Structures: a large-scale atomistic electronic structure and ballistic transport</i>
M.S., Physics 2009	Bilkent University, Ankara, Turkey Thesis Title: <i>Slow Light in Germanium Nanocrystals</i>
B.S., Physics 2007	Bilkent University, Ankara, Turkey

Research Experience

- **Bilkent University**, Ankara, Turkey
 - National Magnetic Resonance Research Center, Postdoctoral Research Fellow **Sep 2015 - present**
 - Integrating statistical learning and natural language processing techniques with fMRI experiments to probe how the human brain represents visual and auditory information
 - Department of Physics, Postdoctoral Research Fellow **Jan-Sep 2015**
 - Implemented computational models for guiding the development and production of light emitting diode chips and lamps
 - Department of Physics, Research Assistant **2007 - 2014**
 - Developed computational frameworks for investigating the electronic structure and quantum transport properties of silicon-based nanomaterials
- **Helmholtz-Zentrum Dresden - Rossendorf**, Dresden, Germany
 - Visiting Scientist **Nov-Dec 2011 & Jun-Jul 2012 & Nov 2014**
 - Collaborated with experimental physicists to increase the efficiency of solar cells

Teaching Experience

- **Bilkent University**, Ankara, Turkey
 - Department of Physics, Instructor **Fall 2015**
 - General Physics: Mechanics
 - Department of Physics, Teaching Assistant **2006 - 2014**
 - General Physics: Mechanics, Electricity & Magnetism; Electromagnetic Theory

Related Professional Experience

- **Bilkent University**, Ankara, Turkey
 - Faculty of Science, Computer Systems Administrator **2007 - 2015**
 - Administered web and computing servers
 - Provided assistance and guidance to the faculty members in their computational needs
 - Installed and maintained computing clusters, and assisted research groups in using various computer software programs

Publications and Works in Progress

- *Human scene-selective cortex represents holistic semantic information in natural movies*
Keles, U.; Stansbury, D.; Gallant, J.L.; Çukur, T. (*in preparation*)
- *Inter-regional connectivity in the human brain during category-based visual search*
Dar, S.U.H.; **Keles, U.**; Çukur, T. (*in preparation*)
- *Disorder-free localization around the conduction band edge of crossing and kinked silicon nanowires*
Keles, U.; Cakan, A.; Bulutay, C.
Journal of Applied Physics, **117**, 064308 (2015).
- *Networks of silicon nanowires: a large-scale atomistic electronic structure analysis*
Keles, U.; Liedke, B.; Heinig, K.-H.; Bulutay, C.
Applied Physics Letters, **103**, 203103 (2013).

Conferences and Talks

- *Human scene-selective cortex represents the statistical distribution of object and action categories in natural movies*, **Keles, U.**; Stansbury, D.; Gallant, J.L.; Çukur, T.; Annual Meeting of the Society for Neuroscience, San Diego, CA (2016). (Poster)
- *Quantum effects for photovoltaics*, **Keles, U.**, University of Cologne, Cologne, Germany (2014).
- *Silicon nanowire-based complex structures: electronic structure and ballistic transport*, **Keles, U.**, Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany (2014).
- *Electron density profiles of nanowire crossings*, **Keles, U.**, Triebenberg Laboratory, TU Dresden, Dresden, Germany (2014).
- *Computational predictions and experimental verifications on fabrication and properties of sponge-like Si/SiO₂ nanocomposites*, Heinig, K.-H.; Liedke, B.; Schmidt, B.; Huebner, R.; **Keles, U.**; Bulutay, C.; Schumann, E., MRS Spring Meeting, San Francisco, USA (2014).
- *Si nanocrystal networks for photovoltaic applications*, Ozen, E.; Gundogdu, S.; **Keles, U.**; Bulutay, C.; Aydinli, A.; Heinig, K.-H.; Rigato, V., MRS Spring Meeting, San Francisco, USA (2013).
- *Network of percolated Si filaments in SiO₂*, Heinig, K.-H.; Aydinli, A.; Schmidt, B.; Liedke, B.; Friedrich, D.; **Keles, U.**; Bulutay, C., MRS Spring Meeting, San Francisco, USA (2013).
- *Si nanowire networks for 3rd generation solar cells*, Heinig, K.-H.; Schmidt, B.; Mcklich, A.; Liedke, B.; Kelling, J.; Friedrich, D.; Hauschild, D.; Stegemann, K.-H.; Bulutay, C.; **Keles, U.**; Aydinli, A., 4th International Conference on Nanostructure Selfassembly, Sardinia, Italy (2012).
- *Networks of Si nanowires in SiO₂ for solar cells*, Heinig, K.-H.; Schmidt, B.; Mucklich, A.; Liedke, B.; Kelling, J.; Friedrich, D.; Hauschild, D.; Stegemann, K.-H.; **Keles, U.**; Bulutay, C.; Aydinli, A., E-MRS Spring Meeting, Strasbourg, France (2012).
- *Si nanowire networks embedded in SiO₂ formed by spinodal decomposition of SiO*, Heinig, K.-H.; Schmidt, B.; Mucklich, A.; Liedke, B.; Kelling, J.; Friedrich, D.; Hauschild, D.; Stegemann, K.-H.; **Keles, U.**; Bulutay, C.; Aydinli, A., E-MRS Spring Meeting, Strasbourg, France (2012).
- *EFTEM studies of Si nanowire networks in SiO₂ for thin film PV cells*, Liedke, B.; Mucklich, A.; Heinig, K.-H.; Schmidt, B.; Friedrich, D.; **Keles, U.**; Bulutay, C., E-MRS Spring Meeting, Strasbourg, France (2012).
- *Stark effect, polarizability and electroabsorption in silicon and germanium nanocrystals*, **Keles, U.**; Bulutay, C.; Kulakci, M.; Turan, R., E-MRS Spring Meeting, Strasbourg, France (2010).

Skills

○ Technical Skills:

- Programming: Python, R, MATLAB, FORTRAN
- Linux System Administration

○ Languages

- English (full professional proficiency)
- Turkish (mother tongue)