Curriculum Vitae

- **Name Surname:** Serkan Caliskan
- **Title:** Assistant Professor of Physics
- **Work Address:** University of Houston-Clear Lake, Department of Physical and Applied Sciences, 2700 Bay Area Blvd., Houston, TX 77058
- **Phone:** (281) 283-3764
- **E-mail:** caliskan@uhcl.edu

Education

- 1999-2003: PhD in Physics, Gebze Institute of Technology, Turkey (and, partly, Max-Planck-Institute for the Physics of Complex Systems, Germany). Thesis: **"Effects of Bragg reflections and of electronic correlations on conductivity in two dimensional disordered metallic systems"**
- 1997-1999: Master of Science in Physics, Department of Physics, Fatih University, Istanbul, Turkey Thesis: **"Effect of electron-electron interactions and of magnetic field on density of states in disordered metallic systems"**
- 1992-1997: Bachelor of Science in Physics Engineering, Faculty of Engineering, Hacettepe University, Ankara, Turkey (Rank: 3rd)

Work experience

- September 2021 - Present: *Assistant Professor*, Department of Physical & Applied Sciences, ***University of Houston-Clear Lake***, TX, USA
- August 2020-August 2021: *Limited Term Professor*, Department of Physics, ***Kennesaw State University***, GA, USA
- August 2017-June 2020: *Limited Term Professor*, Department of Physics and Astronomy, ***Georgia Southern University***, GA, USA
- July 2014-July 2016: *Professor*, Department of Physics, ***Fatih University***, Istanbul, Turkey
- May 2009-June 2014: *Associate Professor*, Department of Physics, ***Fatih University***, Istanbul, Turkey
- January 2007: *Visiting Scientist*, Department of Physics, ***Umea University***, Sweden
- February 2006-May 2009: *Assistant Professor*, Department of Physics**,** ***Fatih University***, Istanbul, Turkey
- November 2004-January 2006: *Postdoctoral Research Associate*, Department of Physics and Astronomy, ***Mississippi State University***, MS, USA
- October 2003-October 2004: *Postdoctoral Research Associate*, Department of Physics, ***Pohang University of Science and Technology***, Pohang, South Korea
- August 2001- February 2002: *Visiting Scientist*, ***Max-Planck-Institute for the Physics of Complex Systems***, Dresden, Germany

Computer skills

- Operating systems (Windows, Linux)
- Graphics software (Python, LaTeX, QuantumATK)

Profile

- Highly motivated scientist with the knowledge of electronic and magnetic properties of molecular and nanoscale devices.
- Experience in spin based devices and molecular electronics, and development of new material compositions or devices that can be used in various fields.
- Modeling nanoscale structures, molecular junctions and 2D materials. Investigation of these structures is a model for the realistic systems and an insight for the experiments.

Research interests

- Modeling of nanomaterials
- Magnetic materials, spinel ferrites, spin-based devices, small world networks
- Spintronics, nanodevices, nanoelectronics, molecular electronics
- Biosensing devices, sensors
- First principles calculations, spin polarized transport
- Electronic, magnetic, optical and structural properties
- Surface characteristics

Research methods

- Density functional theory (DFT) [LCAO-based, numerical atomic orbital basis sets]
- DFT Codes: ATK
- Green's function technique

Research Projects

- NASA NSPIRES: "Space Materials and Microbiome Research: A Bridge to Future JSC Workforce", submitted in June-2023.
- NSF- LEAPS-MPS: "Exploring mechanical, sensing and spin resolved characteristics of small world network like structures through nanotubes and fullerenes", submitted in January-2023.
- FRSF, Research Project (# A06S22), "Tailoring the Band Gap and Spin Polarized Transport Through Graphene-Like Materials", UHCL, 2022-2023.
- ELPSG, Research Project with student V. U. Cornejo, "A Density Functional Theory study on the spin resolved electronic structure properties of ZnO Nanotubes", UHCL, 2023.
- ELPSG, Research Project with student S. Alexander, "Potential Medical Applications of Boron-Nitride Nanotubes for Drug Delivery Systems", UHCL, 2023.
- ELPSG, Research Project with student A. Mammadov, "Increasing efficiency and applicability of spin FET for insight into experimental studies towards possible use in industry", UHCL, 2021-2022.
- TUBITAK (The Scientific and Technological Research Council of Turkey) Project, *Researcher,* "Theoretical and Experimental Investigations of Spin Injection and Rashba Effect in Ferromagnetic Metal Implanted ZnO Heterostructures", 2011-2014.

- TUBITAK (The Scientific and Technological Research Council of Turkey) Career Project, *Principal Inspector*, Project No: 108T710, "Modeling nano scale structures by small world network theory and investigating spin dependent transport", 2009-2011.
- DPT Project, *Researcher*, "BioNano Technology Research and Development Laboratory Infrastructure Project", 2008-2011

Journal Editor and Editorial Boards

- Micromachines
- Journal of Thermodynamics & Catalysis
- American Journal of Condensed Matter Physics

Reviewer for Academic Journals

- Superlattices and Microstructures
- Journal of Magnetism and Magnetic Materials
- Journal of Alloys and Compounds
- IEEE Transactions on Nanotechnology
- Nanoscale
- Journal of Solid State Chemistry
- Journal of Physics: Condensed Matter
- American Journal of Condensed Matter Physics
- Journal of Electronic Materials
- The Journal of Physical Chemistry
- Journal of Cluster Science

Reviewer and Evaluation of Research Proposals

- Research Grant Reviewer & Evaluator for the "European Innovation Council" (2016 – present).
- Research Grant Evaluator for "P4F Marie Curie-Skłodowska Postdoctoral Programme" (2020 – present).
- Vice Chair of European Research Proposals under European Comission (Future and Emerging Technologies, Novel Ideas for Radically New Technologies) (2015-2016)
- Evaluation of research proposals submitted to The Scientific and Technological Research Council of Turkey (TUBITAK) (2012-2016)

Symposium and Congress Organizations

- Texas Section of APS, American Physical Society
- International Conference and Exhibition on Biosensors and Bioelectronics
- International Conference of Computational Methods in Science and Engineering

Regular Articles

- ***S. Caliskan*** et al., "Structural, magnetic properties, and hyperfine interactions of Ni0.8Cu0.1Zn0.1MoxFe2−2xO4 ($0.0 \leq x \leq 0.1$) nanospinel ferrites", *Applied Physics A*, 129, 582, 2023.

- ***S. Caliskan*** et al., "Impact of vanadium substitution on structural, magnetic, microwave absorption features and hyperfine interactions of SrCo hexaferrites", *Journal of Alloys and Compounds*, 960, 170578, 2023.
- ***S. Caliskan***, M.A. Almessiere, A. Baykal, Y. Slimani, "A first principles study on electronic structure, magnetic and optical characteristics of Se doped CoNiFe2O4 spinel ferrites", *Computational Materials Science*, 226, 112243, 2023.
- ***S. Caliskan***, M.A. Almessiere, A. Baykal, A. Demir Korkmaz, H. Gungunes, Z. Alsalemd, Y. Slimani, E. Gokce Polat, "Effects of Pr3+ ion doping on magnetic features of Ni–Co nanospinel ferrites via sonochemical approach", *Journal of Magnetism and Magnetic Materials*, 570, 170492, 2023.
- ***S. Caliskan***, M. A. Almessiere, A. Baykal, Y. Slimani, U. Baig, "Structural and magnetic features of Pr, PrY, PrYDy doped and undoped CoNi nanospinel ferrites", *Inorganic Chemistry Communications*, 153, 110752, 2023.
- Y. Slimani,M.A. Almessiere,A. Baykal,H. Gungunes, Z. Alsalem, A. D. Korkmaz, S. Akhtar, ***S. Caliskan***, "Impact of Er-Y co-doping on structure, magnetic features, and hyperfine interactions of NiCo nanospinel ferrites: Sonochemical synthesis", *Inorganic Chemistry Communications*, 152, 110719, 2023.
- Y. Slimani, M.A. Almessiere, M.J.S. Mohamed, E. Hannachi, ***S. Caliskan***, S. Akhtar, A. Baykal, M.A. Gondal, "Synthesis of Ce and Sm Co-Doped TiO2 Nanoparticles with Enhanced Photocatalytic Activity for Rhodamine B Dye Degradation", *Catalysts*, 13, 668, 2023.
- M.J.S. Mohamed, ***S. Caliskan***, M. A. Gondal, M.A. Almessiere, A. Baykal, Y. Slimani, K.A. Elsayed, M. Hassan, I.A. Auwal, A.Z. Khan, A.A. Tahir, A. Roy, "Se-Doped Magnetic Co−Ni Spinel Ferrite Nanoparticles as Electrochemical Catalysts for Hydrogen Evolution", *ACS Applied Nano Materials*, 6, 7330, 2023.
- S. Akhtar, Y. Slimani, M.A. Almessiere, A. Baykal, E. Gokce Polat, ***S. Caliskan***, "Influence of Tm and Tb co-substitution on structural and magnetic features of $CoFe_2O_4$ nanospinel ferrites", *Nano-Structures & Nano-Objects*, 33, 100944, 2023.
- M. Sertkol, Y. Slimani, M.A. Almessiere, A. Baykal, S. Akhtar, E.G. Polat, ***S. Caliskan***, "Magnetic and optical characterizations of Dy-Eu co-substituted $Mn_{0.5}Zn_{0.5}Fe_2O_4$ nanospinel ferrites", *Journal of Molecular Structure*, 1277, 134891, 2023.
- ***S. Caliskan***, A. Mammadov and S. Masood, "A first principles study on spin dependent electronic characteristics of zinc oxide nanowires linked to nickel electrodes", *Solid State Communications*, 369, 115211, 2023.
- Samina Masood, ***S. Caliskan***, "Equation of state of fermions in neutron stars", arXiv preprint arXiv:2206.09486, 2022.
- ***S. Caliskan***, "Structural, Electronic and Adsorption Characteristics of Transition Metal doped TM@C70 Endohedral Fullerenes", *Journal of Cluster Science*, 32, 77, 2021.
- ***S. Caliskan***, "A First Principles Study on Spin Resolved Electronic Properties of X@C70 (X = N, B) Endohedral Fullerene Based Molecular Devices", *Physica E: Low-dimensional Systems and Nanostructures*, 108, 83, 2019.
- ***S. Caliskan***, "Spin Resolved Electronic Structure and Transport Properties of Zinc Oxide Nanoribbon Based Devices", *Physica E: Low-dimensional Systems and Nanostructures*, 107, 67, 2019.
- ***S. Caliskan***, "Spin Resolved Electronic Transport through N@C20 Fullerene Molecule between Au Electrodes: A First Principles Study", *Physica E: Low-dimensional Systems and Nanostructures*, 99, 43, 2018.

- *G. Yildizhan,* ***S. Caliskan***, R. Ozturk, "Palladium and Platinum Based Solid and Hollow Nanoparticles: An ab-initio Study of Structural and Electronic properties", *Journal of Solid State Chemistry*, 260, 52, 2018.
- ***S. Caliskan***, S. Guner, O. Gurbuz, "Electronic structure properties of doped and imperfect ZnO sheets", *IEEE Transactions on Nanotechnology*, 15, 775, 2016.
- S. Yusuf, ***S. Caliskan*** and A. Marmori, "Spin Resolved Analysis on Electronic Structural Properties of Zinc Oxide Nanosheet Attached to Ni Electrodes with Carbon Sheet for Comparison", *IOSR J. Applied Physics*, 7, 19, 2015.
- O. Gurbuz, I. Kurt, ***S. Caliskan***, S. Guner, "Influence of Al concentration and annealing temperature on structural, optical, and electrical properties of Al co-doped ZnO thin films", *Applied Surface Science*, 349, 549, 2015.
- ***S. Caliskan***, F. Hazar, "First principles study on the spin unrestricted electronic structure properties of transition metal doped InN nanoribbons", *Superlattices and Microstructures*, 84, 170, 2015.
- ***S. Caliskan*** and S. Guner, "First principles study on the spin dependent electronic behavior of Co doped ZnO structures joining the Al electrodes", *J. Alloys and Compounds*, 619, 91, 2015.
- ***S. Caliskan*** and S. Guner, "The role of Co atoms in spin dependent electronic properties of graphite-like ZnO structures", *J. Mag. and Mag. Mater*., 373, 96, 2015.
- O. Gurbuz, S. Guner, O. Buyukbakkal, ***S. Caliskan***, "Structural, optical, and conducting properties of crystalline ZnO:Co thin films grown by reactive electron beam deposition", *J. Mag. and Mag. Mater*., 373, 90, 2015.
- ***S. Caliskan*** and A. Laref, "Spin transport properties of n-polyacene molecules (n=1-15) connected to Ni surface electrodes: Theoretical analysis", *Scientific Reports*, 4, 1, 2014.
- S. Guner, O. Gurbuz, ***S. Caliskan***¸ V.I. Nuzhdin, R. Khaibullin, M. Ozturk, N. Akdogan, "The structural and magnetic properties of Co+implanted ZnO films", *Applied Surface Science*, 310, 235, 2014.
- ***S. Caliskan*** and A. Laref, "The anchoring effect on the spin transport properties and I–V characteristics of pentacene molecular devices suspended between nickel electrodes", *Phys. Chem. Chem. Phys.*, 16, 13191, 2014.
- ***S. Caliskan***, "Tuning the spin dependent behavior of monatomic carbon wires between nickel electrodes", *Physics Letters A*, 377, 1766, 2013.
- ***S. Caliskan*** and M. Canturk, "Spin dependent transport behavior in small world networks", *The European Physical Journal B*, 85, 327, 2012.
- ***S. Caliskan*** and M. Kumru, "High-order perturbation corrections to the density of states of disordered metals in a magnetic field", *Phys. Rev. B*, 85, 205148, 2012.
- ***S. Caliskan***, "Spin dependent behavior in a Rashba film", *Journal of Applied Physics*, 107, 053706, 2010.
- E.Sasioglu, ***S. Caliskan***, M. Kumru, "Critical behavior of density of states near Fermi energy in low-dimensional disordered metals", *Phys. Rev. B*, 79, 035123, 2009.
- ***S. Caliskan***, M. A. Novotny, and J. I. Cerdá, "Transport through small world networks", *Journal of Applied Physics*, 102, 013707, 2007.
- ***S. Caliskan*** and M.Kumru, "The effect of magnetic field on a nonballistic spin field effect transistor", *J. Phys.: Condens. Matter*, 19, 076205, 2007.
- ***S. Caliskan***, "Conductance modulation of a nonballistic Datta-Das spin field effect transistor", *J. Phys.: Condens. Matter*, 18, 10313, 2006.
- H. W. Lee, ***S. Caliskan*** and Hyowon Park , "Mesoscopic effects in a single-mode Datta-Das spin field-effect transistor", *Phys. Rev. B*, 72, 153305, 2005.

- E. P. Nakhmedov, V. Prigodin, ***S. Caliskan***, E. Sasioglu , "Effects of correlation on the conductivity of a two-dimensional weakly disordered lattice with particle-hole symmetric energy bands: Metal-insulator transition at half filling", *Phys. Rev. B*, 66, 233105, 2002.
- ***S. Caliskan***, E.Sasioglu, E. P. Nakhmedov, M. Kumru, O. Cakiroglu, B. Karaoglu , "Mean field approach to the correlation effects on the density of electronic states and conductivity of disordered metals", *Phys. Stat.sol.(b)*, 229, 1205, 2002.
- ***S. Caliskan***, E. Sasioglu, E. P. Nakhmedov, M. Kumru, "Effects of Electon-Electon Interactions and of Magnetic Field on Density of States in Disordered Metallic Systems", *Bulgarian Journal of Physics*, 27, 94, 2000.

Conference Proceedings/Abstracts/Presentations/ Schools

- ***S. Caliskan***, "Influence of Transition Metals on Mechanical and Electronic Structure Properties of Boron Nitride Nanotubes", Bulletin of the American Physical Society, American Physical Society, 2023.
- A. Rodriguez, ***S. Caliskan***, "The role of impurities on the electronic properties of graphene nanoribbons", Bulletin of the American Physical Society, American Physical Society, 2022.
- A. Majgaonkar, ***S. Caliskan***, S. Masood, "Interaction of ZnO With Bacteria", Bulletin of the American Physical Society, American Physical Society, 2022.
- A. Mammadov, ***S. Caliskan,*** "Tailoring The Spin Dependent Electronic Transport of Low Dimensional Materials", Bulletin of the American Physical Society, American Physical Society, 2021.
- "*The Society of HPC Professionals on Quantum Computing*", Oct. 2021.
- ***S. Caliskan***, "Spin Resolved Electronic Behavior of Zno Nanoribbons", ICNMN 2018 : 20th International Conference on Nanostructured Materials and Nanotechnology, Miami, USA, March 2018.
- ***S. Caliskan***, "Role of transition metal dopants on the spin dependent electronic behavior of nanotubes", 2nd International Conference and Exhibition on Mesoscopic and Condensed Matter Physics, Chicago, USA, October 2016.
- ***S. Caliskan***, "Spin dependent transport in disordered monatomic systems", Donostia International Conference on Nanoscaled Magnetism and Applications 2013, San Sebastian, Spain, DICNMA-2013, Sep. 2013.
- ***S. Caliskan*** and M. Canturk , "Spin Polarized Transport Properties of Disordered Systems", 2nd International Symposium on Computing in Science and Engineering, Kusadasi, Turkey, Jun. 2011.
- ***S. Caliskan*** and M. Canturk , "Spin Polarized Transport Properties of Impurity Induced Carbon Nanostructures", APS March Meeting, Dallas, TX, USA, Mar. 2011.
- ***S. Caliskan***, "Spin Dependent Transport in Low Dimensional Systems", Turkish Physical Society International 26th Physics Conference, Bodrum, Turkey, Sep. 2009.
- ***S. Caliskan***, "Advanced Workshop on Spin and Charge Properties of Low Dimensional Systems", The Abdus Salam International Centre for Theoretical Physics, Sibiu, Romania, April 2009.
- M. A. Novotny, J. Yancey, S. Gwaltney, ***S. Caliskan***, "Quasi Small-World Nanomaterials : Quantum Studies", APS March Meeting, Baltimore, MD, USA, Mar. 2006.
- H. W. Lee, ***S. Caliskan*** and H. Park , "Period Halving in a Single-Mode Datta-Das Spin Field Effect Transistor", AIP Conference Proceedings, 24th International Conference on Low Temperature Physics, 850, 1510, 2006.
- ***S. Caliskan***, M. Novotny, "One Dimensional Transport on Small World Network", 93rd Statistical Mechanics Conference, Piscataway, NJ, USA, May. 2005.

- H. W. Lee, ***S. Caliskan***, H. Park, "Nonballistic two-channel Datta-Das spin field effect transistor", 2005 APS March Meeting , Los Angeles, CA, USA, Mar. 2005.
- "APCTP (Asia Pacific Center for Theoretical Physics) Focus Program on Quantum Chaos and its Applications to Mesoscopic Physics", POSTECH, Pohang, SOUTH KOREA, June 2004.
- "Lectures on Spintronics: Therory and Applications", Yonsei University, Seoul, SOUTH KOREA, Dec. 2003.
- "APCTP (Asia Pacific Center for Theoretical Physics) Focus Program on Quantum Effects in Nanosystems", POSTECH, Pohang, SOUTH KOREA, November-2003.
- ***S. Caliskan***, E. Nakhmedov, V. Prigodin, "Metallic Behaviour in Two Dimensional Interacting Disordered Systems at Half-Filling", 9th Statistical Physics Days, Istanbul, Turkey, Jul. 2002.
- ***S. Caliskan***, E. Sasioglu, E. P. Nakhmedov, M. Kumru, "Effects of Electon-Electon Interactions and of Magnetic Field on Density of States", Fourth General Conference of the Balkan Physical Union, Veliko Turnovo, Bulgaria, Aug. 2000.
- ***S. Caliskan***, E. Nakhmedov, M. Kumru, "Correlation effects on Density of States in Disordered systems", Turkish Physical Society 17th Physics Conference, Alanya, Turkey, Oct. 1998.

Posters

- A. Rodriguez, ***S. Caliskan***, "Role of impurities on the electronic transport and structural characteristics of doped graphene nanoribbons", The 29th Annual Student Conference for Research and Creative Arts, UHCL, April 2023.
- V. U. Cornejo, ***S. Caliskan***, "A DFT study on structural and spin dependent electronic properties of ZnO Nanotubes", The 29th Annual Student Conference for Research and Creative Arts, UHCL, April 2023.
- S. Alexander, ***S. Caliskan***, "Structural, Electronic and Magnetic Characteristics of Doped Boron Nitride Nanotubes", The 29th Annual Student Conference for Research and Creative Arts, UHCL, April 2023.
- ***S. Caliskan***, "Modeling of Nano scale structures and applications", Sustainable Research Pathways, Berkeley, CA, November 2021.
- ***S.Caliskan***, "Role of dopants on the spin dependent electronic behavior of nanotubes", International Conference on Spin Physics, Spin Chemistry and Spin Technology, St. Petersburg, Russia, SPCT-2015, June 2015.
- S. Guner, O. Gurbuz, N. Akdogan, R. Khaibullin, ***S. Caliskan***, "The structural, magnetic and conducting properties of Co implanted ZnO crystalline films", Poster, Nanotech Conference & Expo, Washington, DC, USA, May 2013.

Theses Supervised

- Fatih Hazar, **"First-principles electronic structure calculations of InN nanowires with substitutional impurities"**, Fatih University, June 2016.
- Seyma Karakoc, **"Quantum Spin Transport in Nanowires"**, Fatih University, March 2016.
- Yunus Kaya, **"A DFT Study on Electronic Properties of Transition Metal Doped Boron Nitride Nanotubes"**, Fatih University, March 2015.
- Aseel Marmori, **"Ab initio study on electronic and magnetic properties of nanoribbons"**, Fatih University, June 2014.
- Yusuf Shehu, **"Spin-Dependent Properties of Two Dimensional Systems Attached to Ferromagnetic electrodes"**, Fatih University, June 2014.

- Fatma Mancusunluoglu, **"Spin Polarized Transport Properties of Impurity Induced Carbon Wires"**, Fatih University, June 2011.
- Hulya Aytan, **"Spin Dependent Transport Properties of Topologically Disordered Systems"**, Fatih University, June 2011.
- Saban Tirpanci, **"Impurity Effect on Spin Field Effect Transistor"**, Fatih University, June 2008.

Lab Manuals

- Modern Physics
- Optics
- Thermodynamics
- Mechanics
- Electricity & Magnetism
- Vibrations & Waves

Courses Taught

- Introductory Physics-I (Mechanics); Introductory Physics-II (Electricity and Magnetism)
- Semiconductor Physics (Undergraduate & Graduate)
- Solid State Physics (Undergraduate & Graduate)
- Statistical Physics (Undergraduate); Statistical Mechanics (Graduate)
- Heat and Thermodynamics
- Fluid Mechanics
- Statics for Engineers
- Modern Physics
- Quantum Theory
- Electrodynamics (Graduate)
- Selected Topics in Physics & Research Topics in Physics (Undergraduate & Graduate)