CURRICULUM VITAE

Professor Muhammet S. Toprak

➢ PERSONAL DATA

1. Birth date and place: 1973, Turkey
2. Citizenship: Swedish & Turkish
3. Address: **KTH** Department of Applied Physics,
   SE10691 Stockholm, Sweden
4. Phone: +46 735 519358
5. E-mail: toprak@kth.se
6. Webpage: www.kth.se/profile/toprak/
   - 6.1. ORCID-ID: 0000-0001-5678-5298
   - 6.2. ResearcherID: C-9328-2011
   - 6.3. Googlescholar: https://scholar.google.se/citations?user=i0_DddkAAAAJ&hl=sv
   - 6.4. Scopus 6603896825

➢ ACADEMIC DEGREES

- Prof. in Materials Chemistry, KTH Royal Institute of Technology, Stockholm, Sweden 2015
- Assoc. Prof., Materials Chemistry, KTH Royal Institute of Technology, Stockholm, Sweden 2009
- Ph. D., Materials Chemistry, KTH Royal Institute of Technology, Stockholm, Sweden 2003
- M.Sc., Chemistry, Middle East Technical University, Ankara, Turkey 1997
- B.Sc., Chemistry Education, Middle East Technical University, Ankara, Turkey 1995

➢ EMPLOYMENT HISTORY

Sep 2016 -	Professor @ Bio-Opto-Nano Physics Department of Applied Physics, SCI School, KTH, Sweden
2015 – Sep 2016	Professor @ Functional Materials Division, Department of Materials and Nano- Physics, ICT School, KTH, Sweden
2012 - 2015	Division Head, Assoc. Prof. Functional Materials Division, ICT School, KTH, Sweden
2012-2014	Assoc. Prof. in Materials Science and Eng. Dept. Yildirim Beyazit University, Ankara, Turkey
2009 – 2012	Assoc. Prof. in Materials Chemistry, Research Group leader Functional Materials Division, ICT School, KTH, Sweden
Aug 2007 - Sep 2009	Research Scientist Functional Materials Division, ICT School, KTH, Sweden
June 2005 – July 2007	Research Associate, Dept of Chemistry & Biochemistry University of California at Santa Barbara, CA, USA.
June 2003 - May 2005	Senior Researcher (Forskare) and Lecturer Dept of Materials Science and Engineering, KTH, Sweden
June 2004 - May 2005	Vice headmaster of Graduate Studies, Dept of Materials Science and Engineering, KTH, Sweden

➢ PROFESSIONAL AWARDS

- Global Star Award given by the American Ceramic Society (ACerS), 2024.
- Ingemar Croon Award 2016 for the SME LETSNANO AB
- Olle Eriksson foundation for Materials Technology, 2017-2018
- Spin-off Market Survey Financial Award (VFT1), 2015, KTH Innovation Office,
- Spin-off Market Survey Financial Award (VFT0), 2014 KTH Innovation Office
- Academic Achievement Award, 2012 Swedish Turkish Business network – SWETURK
- Full Position Support at KTH, ICT School, FNM
  Knut and Alice Wallenberg's Foundation, Sweden. Aug 2007 - Aug 2010
- Dow Materials Use award in New Venture Competition at UCSB, as a part of Technology Management Program (TMP).
- Information about the TMP and some photos from the competition can be found at: http://www.tmp.ucsb.edu/extracurricular/nvc_photos_07/052.html
- Scholarship, Post Doctoral Studies at UC Santa Barbara, UCSB, USA
  Knut and Alice Wallenberg's Foundation, Sweden. June 2005 – July 2007
- Munir-Birsel Scholarship for Ph.D. studies
- The Scientific and Technological Research Council of Turkey, TUBITAK. 1998 – 1999
- Scholarship for Master Studies
- The Scientific and Technological Research Council of Turkey, TUBITAK. 1996 – 1997

➢ HONORS, SCHOLARLY AND PROFESSIONAL DUTIES AND ACHIEVEMENTS

1. Program committee for 49th Int. Conf. on Adv. Ceramics and Comp.-ICACC2025, USA 2025
2. Program committee for 48th Int. Conf. on Adv. Ceramics and Comp.-ICACC2024, USA 2024
3. Program committee for 47th Int. Conf. on Adv. Ceramics and Comp.-ICACC2023, USA 2023
4. Program committee for 46th Int. Conf. on Adv. Ceramics and Comp.-ICACC2022, USA 2022
5. Program committee for 45th Int. Conf. on Adv. Ceramics and Comp.-ICACC2021, USA 2021
6. Reviewing Promotion Cases for universities in UK, Singapore, Pakistan
7. Reviewing project proposals for the Scientific Research Council of Turkey
8. Reviewing project proposals for the Research Councils of Cyprus, Belgium, Netherlands
9. Chairman in several PhD disputations. Examination committee member in several PhD disputation in various Swedish and International Universities.
10. Program committee for 4th Int. Conf. on Nanostructures-ICNS4, Kish Island, March 2012; ISS 2014 together with ICTP, Islamabad, Pakistan, 2014;
11. Program committee for 43rd Int. Conf. on Adv. Ceramics and Comp.-ICACC2019, USA 2019
12. Editorial Board Member of Journal of Nanomaterials.
13. Refereeing for respected scientific journals: Scientific Reports, Advanced Materials, Advanced Functional Materials, RSC Advances, Nano Letters, Chemical Communications, Langmuir, Journal of Materials Chemistry, Materials Science and Engineering C, Materials Letters, International Journal of Environment and Resource (IJER), Carbon, etc.
14. COST- MP1206, Electrospun nano-fibres for bio inspired composite materials and innovative industrial applications, Committee Member.
15. COST- CA18132, Functional Glyconanomaterials for the Development of Diagnostics and Targeted Therapeutic Probes
16. COST- CA21148, Research and International Networking on Emerging Inorganic Chalcogenides for Photovoltaics (RENEW-PV)

➢ MEMBERSHIP

1. American Ceramic Society
2. American Chemical Society
3. Materials Research Society

4. SWENANOTOX, Swedish Nanotoxicology Society

➢ INVITED LECTURES AND INVITED TALKS

- ➢ *Recent Developments on Inorganic Nanoparticles for In-vivo X-Ray Fluorescence Bioimaging,* International Conference on Advanced Functional Materials and Devices (AFMD -2024), February 26-29, 2024, Chennai, India.
- ➢ *Green Chemical Syntheses, Electrophoretic Deposition and Characterization of Nanostructured Bi_2Te_3* 48th Int. Conf. on Adv. Ceramics and Comp.-ICACC2024, January 28-Feb 2, 2024 | Hilton Daytona Beach Resort and Ocean Center | Daytona Beach, FL, USA.
- ➢ *Recent Developments on Inorganic Nanoparticles for In-vivo X-Ray Fluorescence Bioimaging.* 48th Int. Conf. on Adv. Ceramics and Comp.-ICACC2024, January 28-Feb 2, 2024 | Hilton Daytona Beach Resort and Ocean Center | Daytona Beach, FL, USA.
- ➢ *Nanoparticle-based Contrast Agents Engineered for Biomedical Imaging.* The 8 "Zhi-Hong" International Summer School of Advanced Materials (ISS-AM)–Future Materials | July 2-14, 2023 | SJTU, Shanghai – China.
- ➢ *High-Efficiency Thermoelectric Bismuth- Antimony Chalcogenides and their Hybrids through Bottom-up Syntheses and Processes*. ICPHMS 2023, February 27-28, 2023, Pakistan
- ➢ *Multimodal Contrast Agents for Complementary XFCT-MRI Bioimaging.* ICACC 2023 – 47th International Conference and Expo on Advanced Ceramics and Composites, Jan 24-28, 2023 | Hilton Daytona Beach Resort and Ocean Center | Daytona Beach, FL, USA
- ➢ Green Chemical Syntheses of High-Efficiency Nanostructured Bi_2Te_3 and its Hybrids ICACC 2023 – 47th International Conference and Expo on Advanced Ceramics and Composites, Jan 24-28, 2023 | Hilton Daytona Beach Resort and Ocean Center | Daytona Beach, FL, USA.
- ➢ Colloidal nanoparticles developed for biomedical Applications, 2nd Symposium on Nanoparticles in Biomedical Applications, December 13th, 2022, Biomedicum, Karolinska Institute, Solna, Sweden
- ➢ Thermoelectric Materials for Wast-heat Harvesting. SMH Workshop: Green energy and materials for a sustainable future, October 20th, 2022, Stockholm, Sweden
- ➢ Can paint generat electricity? Nobel Calling, 1-10 October 2022, Stockholm, Sweden.
- ➢ Development of promising nanostructured thermoelectric materials and their hybrids through sustainable chemical routes | the Joint International Scientific Conference "Functional Materials and Nanotechnologies" and "Nanotechnologies and Innovations in the Baltic Sea Region" (FM&NT - NIBS 2022) | July 3-6 2022, Riga, Latvia
- ➢ Development of Custom-designed Nanoparticles with Various Surface Functionalities for Biomedical Applications. ICACC 2022 – 46th International Conference and Expo on Advanced Ceramics and Composites, Jan 24-28, 2022 | Virtual Meeting.
- ➢ Antibacterial Activity of Glycan Iron Oxide Nanoparticles based on Carbohydrate-Lectin Interactions. ICACC 2022 – 46th International Conference and Expo on Advanced Ceramics and Composites, Jan 24-28, 2022 | Virtual Meeting.
- ➢ Rapid and Green Chemical Syntheses of High-Efficiency Nanostructured Bi2Te3. ICACC 2022 – 46th International Conference and Expo on Advanced Ceramics and Composites, Jan 24-28, 2022 | Virtual Meeting.
- ➢ Development and Stability Studies of nano-MoOx contrast agents for XFCT bio-imaging, ICACC 2021 – 45th International Conference and Expo on Advanced Ceramics and Composites, feb 8-12, 2021 | Virtual Meeting.

- Monitoring and Probing the stability and dissolution of nano-MoOxcontrast agents for XRF bioimaging, ICACC 2020 – 44th International Conference and Expo on Advanced Ceramics and Composites, January 27-jan 31, 2020 | Hilton Daytona Beach Resort and Ocean Center | Daytona Beach, FL, USA
- High throughput synthesis of nano- structured thermoelectric materials, International Conference on Thermoelectrics, 12 - 14 of June 2019, San Sebastián, Spain.
- Nano-probes for X-ray Fluorescence Bio-imaging, ICACC 2019 – 43nd International Conference and Expo on Advanced Ceramics and Composites, January 27-feb 1, 2019 | Hilton Daytona Beach Resort and Ocean Center | Daytona Beach, FL, USA
- Engineering Nanomaterials for Energy Applications
  City University of Hong Kong, Hongkong, 2018
- Promising Nanostructured Cu_2Se Thermoelectrics via High Throughput and Rapid Chemical Synthesis, ICACC 2018 – 42nd International Conference and Expo on Advanced Ceramics and Composites, January 21-26, 2018 | Hilton Daytona Beach Resort and Ocean Center | Daytona Beach, FL, USA
- Promising bulk nanostructured thermoelectrics via high throughput and rapid chemical synthesis, 15th European Conference on Thermoelectrics, ECT2017, September 25-27, Padua, Italy, 2017.
- Synthesis and Characterization of Inorganic Nanomaterials
  Nanotoxicology Course, Karolinska Institute, Sweden – September 2017
- Microwave assisted synthesis of $Y_2O_3:M^{3+}$ downconversion and upconversion nanophosphors, ICACC 2017–41st International Conference and Exposition On Advanced Ceramics And Composites, January 22 – 27, 2017 | Hilton Daytona Beach Resort and Ocean Center | Daytona Beach, Fla., USA
- Design and implementation of colloidal nanostructures for photonics
  Sweden-Japan Workshop on Nanoscale Electron-Photon Interactions via Energy Dissipation and Fluctuation, November 26-27, 2015, Stockholm, Sweden
- COST ACTION MP1206 *Training School on Advanced Characterization Techniques for Electrospun Nanofibers:* Hands-on Experience; June 10-12, 2015, UNAM, Bilkent-Ankara, TR
- How to Characterize Physico-Chemical Properties of Nanomaterials
  7th International Nanotoxicology Congress, NANOTOX2014 / April 23-26, 2014 Antalya, Turkey
- Nano-engineered Thermoelectrics
  International Conference on Nanotechnology, Nanomaterials & Thin Films for Energy Applications, University College London, London, UK; 19-21 Feb 2014
- Engineering Nanomaterials for Energy Applications
  Stockholm University, 2014
- Nanomaterials for Energy Applications
  Islamabad, Pakistan, March 10-14, 2014; ISS2014, National Centre for Physics and International Centre for Theoretical Physics (ICTP)
- Nanoengineered Thermoelectric Materials for Waste Heat Recovery
  Islamabad, Pakistan, March 10-14, 2014; ISS2014, National Centre for Physics and International Centre for Theoretical Physics (ICTP)
- Environment Friendly Thermoelectric Materials
  Islamabad, Pakistan, March 10-14, 2014; ISS2014, National Centre for Physics and International Centre for Theoretical Physics (ICTP)
- Engineering Nanomaterials for Energy Applications
  ISS 2013, 14 March 2013, Islamabad; National Centre for Physics and International Centre for Theoretical Physics (ICTP)
- Bulk Nanostructured Thermoelectric Bismuth Telluride
  4th International Conference on Nanostructures-ICNS4, March 12-14, 2012; Kish Island, Iran.
- Thermoelectric Materials for Energy Harvesting (Plenary Talk)

(ABAS) 1st International Conference on Advanced Basic & Applied Sciences, Nov 6-9, 2012, Hurghada, Egypt.

- Quantum dots based hybrid nanocomposites for photovoltaics (Invited Talk)
  (ABAS) 1st International Conference on Advanced Basic & Applied Sciences, Nov 6-9, 2012, Hurghada, Egypt.
- Nanomaterials for Energy Applications
  CLUSTER Course in Materials for Energy, Tällberg in Swedish Dalarna, October 9-14, 2011.
- Nanoengineering Thermoelectric Materials
  In Thermoelectrics for future energy management. Royal Swedish Academy of Engineering Sciences, IVA; September 15, 2011; Stockholm, Sweden – 2011.
- Solution based semiconductors for optical/opto-electronic applications
  Swedish Optical Society, November 25, 2010, Kista-Sweden – 2010.
- Applications of Nanotechnology in Energy
  Azad University, October 26 2010, Tehran-Iran – 2010.
- Applications of Nanotechnology in Energy
  Iran University of Science and Technology, October 24, 2010, Tehran-Iran – 2010.
- Applications of Nanotechnology in Energy
  The Third International Nanotechnology Festival (Iran Nano 2010), Tehran-Iran – 2010.
- Nanomaterials for Energy Applications
  Zirve University Nanotechnology Research and Application Center (ZUNAM), G.Antep-Turkiye – 2010.
- Nanomaterial Synthesis and Characterization
  Second Nanosafety Autumn School, Understanding Human Health Effects and Environmental Impacts of Engineered Nanomaterials San Servolo Island, October 4-8, 2010, Venice-Italy.
- Synthesis and Characterization of Inorganic Nanomaterials
  NANOTOXICOLOGY, Karolinska Institute, Sweden – 2010
- Colloidal Q-dot solar cells
  KTH Winter School on "Photonics for Energy" – 2009
- Introduction to Nanotechnology
  Microsystems Technology course at KTH – 2008, 2009, 2010
- Synthesis of Nanostructured Bulk Thermoelectrics,
  451st Wilhelm and Else Heraus Seminar, Bad Honef-2010, Germany.
- Nanomaterials for Energy Applications,
  Bilkent University-UNAM-2008, Ankara, Turkey.

➢ TEACHING

Graduate Courses:

- 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015 Fall Terms,
  - IM2655 Introduction to Nanomaterials and Nanotechnology
  - IM2657/IM2665 Chemistry of Nanomaterials
  - IM2658/IM2666 Characterization of Nanomaterials
  - IM2659 Project in Nanomaterials

2016-2023 Autumn Terms → these courses are part of Nanotechnology Master program and will be continued until the program content changes

- SK2770 Introduction to Nanotechnology
- SK2761 Characterization of Nanomaterials
- SK2003 Project in Applied Physics
- SK2772 Chemistry for Nanotechnology
- SK2757 Project in Nanomaterials

2019-2024 Spring Term → the course is a part of Nanotechnology Master program and will be continued until the program content changes

- SK2773 Nanothermodynamics
- SK2760 Chemistry of Nanomaterials

➢ GRADUATE STUDENT SUPERVISION (M.Sc. + Ph.D.)

M.Sc. Students

1. Mihai Ciobanu (2024), Surface Bioengineering of Multifunctional Nanoparticles for X-ray Fluorescence Imaging (TRITA-SCI-GRU 2024:047), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
2. Shwetha Satish (2024), Structural Characterization of Fibre Foam Materials Using Tomographic Data (TRITA-SCI-GRU ; 2024:001), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
3. Pinar Genc (2023): Green Chemical Synthesis and Characterization of Ag_2Se and Ag_2Se-PMMA Hybrid Films for Thermal Energy Harvesting (TRITA-SCI-GRU 2023:362), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
4. Wilhelm Holmberg (2023): Radiation Effects on GaN-based HEMTs for RF and Power Electronic Applications (TRITA-SCI-GRU 2023:319), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
5. Xinyi Wei (2023): Glyoxylic-Modified Lignin for Synthesis of Smart Elastomer and Composite Materials (TRITA–SCI-GRU ; 2023:121), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
6. Ronak Kakadiya (2022): Core-Shell Superparamagnetic Iron Oxide Nanoclusters for Bioconjugation (TRITA-SCI-GRU ; 2022:205), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
7. Dalibor Belanovic (2022): Thermolysis synthesis of nanostructured copper sulfides and their thermoelectric evaluation (TRITA-SCI-GRU 2022:159), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
8. Daniel Cortés García (2022): Water-based Synthesis of Superparamagnetic X-ray Fluorescent Contrast Agents (TRITA-SCI-GRU ; 2022:122), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
9. Hitesh Khanna Pedaprolu (2022): Investigation on the effect of pore size and surface area of mesoporous silica on the conductivity of solid composite electrolytes (TRITA-SCI-GRU ; 2022:002), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
10. Nüzhet Inci Kilic (2021): Graphene Quantum Dots as Fluorescent and Passivation Agents for Multimodal Bioimaging (TRITA-SCI-GRU ; 2021:043), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
11. Moeen Akhtar (2021): Characterization of industrial foulants and designing antifouling surfaces (TRITA-SCI-GRU 2021:057), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
12. Xiaofan Ma (2021): The use of graphene quantum dots as detection elements in nanomaterials-based sensors for forensic applications (TRITA-SCI-GRU 2021:60), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
13. Carl Fredrik Åslund (2021); Detection of Amphetamine with Graphene Quantum Dots (TRITA-SCI-GRU 2020:378), KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
14. Jaskaran Singh Malhotra (2020): **M. Sc.** Carbon materials from biomass for supercapacitors, KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
15. Sarah Olsen (2020): **M. Sc.** Synthesis of Copper Sulphides: A Green Chemistry Microwave Approach, KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
16. Bo Yu (2020): **M.Sc.** Fabrication and Evaluation of Sb2Te3 /PVDF Hybrid Thermoelectric Films, KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
17. Moon Paul (2020): **M. Sc.** Facile Microwave Assisted Aqueous Chemical Synthesis of Bi2Te3 and Sb2Te3 Thermoelectric Materials, KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden

18. Pontus Cronqvist (2019): **M. Sc.** Chemistry of Ascorbic Acid Reduction of Graphene Oxide; Reduction of Graphene Oxide in Solution and Film**,** KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
19. Shah, Syed Zulfiqar Hussain (2019): **M. Sc.** Fabrication and Evaluation of Solution Processed Thermoelectric Thin Films**,** KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
20. Saladino, Giovanni Marco (2019): **M. Sc.** Superparamagnetic Hybrid Microspheres as a Reliable Platform for Bio-functionalization**,** KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
21. Paladino, Nicoletta (2019): **M. Sc.** Nanomaterials fort he consolidation of iron-tannate dyes**,** KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
22. Eneborg, Alexander (2019): **M. Sc.** Improvement and Characterization of Aqueous Graphene Dispersions**,** KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
23. Roosmark, Viking (2018): **M. Sc.** Microwave assisted synthesis of thermoelectric nanostructures: p- and n-type Bi2-xSbxTe3**,** KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
24. Wärnheim, Alexander (2018): **M. Sc.** Synthesis and characterization of a water-based hybrid nanophosphor-nanocellulose ink**,** KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
25. Hazal Batılı (2018): **M. Sc.** Synthesis and Electrophoretic Deposition of Citrate-Stabilized Gold Nanoparticles, KTH-Royal Institute of Technology, SCI School, Stockholm, Sweden
26. Natalia Wojas (2016): **M.Sc.,** Synthesis and characterization of molybdenum based nanoparticles for use in X-ray fluorescence bioimaging**,** KTH-Royal Institute of Technology, ICT School, Stockholm, Sweden
27. Lorenzo Vinciguerra (2016): **M.Sc.** Bulk Synthesis and Characterization of Nanostructured $Cu_{2-x}Se$ for Thermoelectric Applications, KTH-Royal Institute of Technology, ICT School, Stockholm, Sweden
28. Wei Zhao (2015): **M.Sc.** Evaluation of Zinc Oxide Nano-Microtetrapods for Biomoelcule Sensing Applications**.** KTH Royal Institute of Technology, ICT School, Kista-Stockholm, Sweden
29. Mikael Karlsson (2015): **M.Sc.** Graphene on silicon carbide for enzymatic based glucose sensors**.** KTH Royal Institute of Technology, ICT School, Kista-Stockholm, Sweden
30. Katayoun Zahmetkesh (2015): **M.Sc.** Characterization of SiGe Nanowires for Thermoelectric Applications. KTH Royal Institute of Technology, ICT School, Kista-Stockholm, Sweden
31. Arash Hojabri (2015): **M.Sc.** Synthesis and characterization of Germanium quantum dots for thermoelectric applications**.** KTH Royal Institute of Technology, ICT School, Kista-Stockholm, Sweden
32. Joydip Paul (2015): **M.Sc.** Nanomaterials for the Decontamination of Waste Water Containing Pharmaceutical Drugs. KTH Royal Institute of Technology, ICT School, Kista-Stockholm, Sweden
33. Amin Hossain (2015): **M.Sc.** Fabrication and Characterization of Bulk Nanostructured Cobalt Antimonide based Skutterudites Materials for Thermoelectric Applications. KTH Royal Institute of Technology, ICT School, Kista-Stockholm, Sweden
34. Bejan Hamawandi (2014): **M.Sc.** Formation of NiGeSn Material for Thermoelectric Applications. KTH Royal Institute of Technology, ICT School, Kista-Stockholm, Sweden
35. Sathya Prakash Singh (2013): **M.Sc.** Carbon Nanotube Nanofluids: Fabrication, Structural and Thermal Conductivity Characterization. Royal Institute of Technology, ICT School, Kista-Stockholm, Sweden
36. Philip Lambertsam (2012), **M.Sc.** Nanocellulose Based Films: Improved Mechanical and Gas Barrier Properties. Royal Institute of Technology, ICT School, Kista-Stockholm, Sweden
37. Mohsen Yakhshi Tafti (2011): **M.Sc.**. Engineered Porous Nanomaterials for Energy Applications. Royal Institute of Technology, ICT School, Kista-Stockholm, Sweden
38. Xuran Yang (2010): **M.Sc.** Synthesis of Hybrid ZnO Nanowires – Quantum Dots and their Photoelectrical Characterization. Royal Institute of Technology, ICT School, Kista-Stockholm, Sweden

39. Yichen Zhao (2010): **M.Sc.** Fabrication of Polymer Quantum Dot Nanocomposites for Optoelectronics. Royal Institute of Technology, School of Information and Communication Technology, Kista- Stockholm, Sweden
40. Roodabeh Afrasiabi (2010): **M.Sc.**. Kinetics of Colloidal Quantum Dots Synthesis By Microwave and Conventional Heating Methods. Royal Institute of Technology-KTH, ICT School, Kista-Stockholm, Sweden
41. Mohsin Saleemi (2009): **M.Sc.** Synthesis and Characterizations of Nanostructured bulk Bismuth Telluride as Thermoelectric material. TRITA-ICT-EX-2009:152, Royal Institute of Technology-KTH, ICT School, Kista-Stockholm, Sweden
42. Md. Sarower Alam (2009): **M.Sc.**. Synthesis, Characterization and MRI application of MnO Nanoparticles. TRITA-ICT-EX-2009:223, Royal Institute of Technology-KTH, ICT School, Kista-Stockholm, Sweden
43. Song Fei (2009): **M.Sc.** Optimization of Fabrication Process of Nanostructured Surfaces for enhanced boiling, ICT/MAP/FNM/2008-2, Royal Institute of Technology-KTH, ICT School, Kista-Stockholm, Sweden

Ph.D. Students

1. Giovanni Saladino (2024): **Ph.D.** Thesis**,** Preclinical X-Ray Fluorescence Imaging with Multifunctional Nanoparticles, (Doctoral dissertation). KTH-Royal Institute of Technology, School of Engineering Sciences, Stockholm, Sweden (ISBN: 978-91-8040-841-7 (print))
2. Hazal Batili (2023): Ph.D. Thesis, Synthesis, Electrophoretic Deposition, and Characterization of Nanostructured Thermoelectric Materials. (Doctoral dissertation). KTH-Royal Institute of Technology, School of Engineering Sciences, Stockholm, Sweden (ISBN: 978-91-8040-651-2 (print))
3. Bejan Hamawandi (2021): **Ph.D.** Thesis**,** Design, Synthesis and Characterization of Nanostructured Thermoelectric Materials. (Doctoral dissertation). KTH-Royal Institute of Technology, School of Engineering Sciences, Stockholm, Sweden (ISBN: 978-91-8040-000-8 (print))
4. Rabia Akan (2021): **Ph.D.,** Metal-assisted chemical etching for nanofabrication of hard X-ray zone plates, KTH-Royal Institute of Technology, School of Engineering Sciences, Stockholm, Sweden
5. Yuyang Li (2020): **Ph.D.** Thesis**,** Synthesis and Characterization of Nanoprobes for X-Ray Fluorescence Computed Tomography (XFCT) Bio-imaging, KTH-Royal Institute of Technology, School of Engineering Sciences, Stockholm, Sweden
6. Venkatesh Doddapaneni (2017): **Ph.D.** Thesis**,** On the polymer-based nanocomposites for electrical switching applications, KTH-Royal Institute of Technology, School of Engineering Sciences, Stockholm, Sweden
7. Mohammad Noroozi (2016): **Ph.D.** Thesis**,** Growth, processing and characterization of group IV materials for thermoelectric applications, KTH-Royal Institute of Technology, ICT School, Stockholm, Sweden
8. Mohsen Y. Tafti (2016): **Ph.D.** Thesis, Nanostructured Bulk Thermoelectrics: Scalable Fabrication Routes, Processing and Evaluation, KTH-Royal Institute of Technology, ICT School, Stockholm, Sweden
9. Yichen Zhao (2016): **Ph.D.** Thesis**,** Semiconducting Polymer Nanofibers and Quantum Dot based Nanocomposites for Optoelectronic Applications, KTH-Royal Institute of Technology, ICT School, Stockholm, Sweden
10. Mohsin Saleemi (2014): **Ph.D**. Thesis, Nano-Engineered Thermoelectric Materials for Waste Heat Recovery, KTH-Royal Institute of Technology, ICT School, Stockholm, Sweden
11. Nader Nikkam (2014): **Ph.D**. Thesis, Nanoengineered materials for heat exchange, KTH-Royal Institute of Technology, ICT School, Stockholm, Sweden
12. Abhilash Sugunan (2012): **Ph.D**. Thesis, Fabrication and Photoelectrochemical Applications of II-VI Semiconductor Nanomaterials, Royal Institute of Technology, ICT, Stockholm, Sweden

13. Robina Shahid (2012): **Ph.D**. Thesis, Green Chemical Synthesis of II-VI Semiconductor Quantum Dots, Royal Institute of Technology, ICT, Stockholm, Sweden
14. Mazher Yar (2012): **Ph.D**. Thesis, Development of Nanostructured Tungsten Based Composites for Energy Applications, Royal Institute of Technology, ICT, Stockholm, Sweden
15. Carmen Vogt (2012): **Ph.D**. Thesis, Engineered core - shell nanoparticles: synthesis, characterisation, and biocompatibility studies, Karolinska Institute, Solna, Sweden
16. Fei Ye (2012): **Ph.D**. Thesis, Chemically Synthesized Nano-Structured Materials for Biomedical and Photonic Applications, Royal Institute of Technology, ICT, Stockholm, Sweden
17. Terrance Burks (2013): **Tekn.Lic**. Thesis, Functionalized Nanomaterials For The Removal Of Chromium (VI) From Aqueous Solutions, Royal Institute of Technology, ICT, Stockholm, Sweden
18. Abhilash Sugunan (2010): **Tekn.Lic**. Thesis, Photochemical and Photoelectric Applications of II-VI Semiconductor Nanomaterials, Royal Institute of Technology, ICT, Stockholm, Sweden
19. Carmen Vogt (2010): **Tekn.Lic**. Thesis, Engineered core – shell nanoparticles for biomedical applications, Royal Institute of Technology, ICT, Stockholm, Sweden
20. Shanghua Li (2006): **Tekn.Lic**. Thesis, Engineering Nanomaterials for Enhanced Functionalitiy, Royal Institute of Technology, MSE, Stockholm, Sweden
21. Shanghua Li (2004): **Ph.D**. Thesis, Fabrication of Nanostructured Materials for Energy Applications, Royal Institute of Technology, MAP, ICT, Stockholm, Sweden

➢ PATENTS and PATENT APPLICATIONS

1. Enhancement of boiling heat transfer by Nanofluid.
   Palm B., Muhammed M., Witharana S., **Toprak M.,** Zhang Y., 2003.
   Swedish Patent Application 0301262-2 (2003).

2. Porous Layer on heat exchanger to increase surface area and heat transfer
   R. Furberg, B. Palm, S. Li, M. Muhammed, **M. Toprak**
   PCT Int. Appl. (2007), 56, CODEN: PIXXD2, WO 2007100297, A1 20070907, CAN 147:346365, AN 2007:998660, (Inventor, Owner)
   (Swedish patent nr. 0600475-8)

3. Suspensions of mesoporous silica as heat exchange fluids and method of preparation thereof
   M. Muhammed, N. Nikkam**, M. S. Toprak**, S. Li, M. Saleemi
   (Swedish patent No: 10009249)

4. Oxidation protective coating of magnetic nanoparticles and methods of preparation.
   D. K. Kim, M. Muhammed, Y. Zhang, **M. Toprak**
   (Swedish Patent Application No: 0200972-8)

5. Method and Apparatus for a simple determination of the stability of suspensions
   N. Nikkam, M. Saleemi, E.B. Haghighi, M. Reza, **M. Toprak**, R. Khodabandeh, M. Muhammed
   (Swedish patent application No: 11009610)

6. Metalworking fluid comprising layered structured particles in a base liquid, method of preparation thereof and its application
   M. Toprak, N. Nikkam, A. Rashid, P. Krajnik, M. Muhammed
   (Swedish patent application No: 1230063-8)

7. Heat exchange fluid comprising layered structured particles in a base liquid, method of preparation thereof and its application
   M. Toprak, N. Nikkam, A. Rashid, P. Krajnik, M. Muhammed
   (Swedish patent application No: 1230064-6)

➢ SCHOLARLY PUBLICATIONS

Ph.D. Dissertation

Toprak, Muhammet S. "Engineered Nanostructures and Thermoelectric Nanomaterials" 2003, PhD Thesis, KTH Royal Institute of Technology, Sweden.

➢ Published Books – Book Chapters

- *H. L. Karlsson, **M. S. Toprak,** and B. Fadeel,*
  Toxicity of metal and metal oxide nanoparticles, In 5th edition of Handbook on the Toxicology of Metals. Edited by Gunnar Nordberg, Elsevier (2022).

- *Hanna L. Karlsson, **Muhammet Toprak**, and Bengt Fadeel*
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22. TOTAL NUMBER OF CITATIONS (LISTED IN CITATION INDEX) -April 2024

- **Citations**: **11032** (Scopus); [**14307** (Google Scholar)]
- **h-Index**: **62** (Scopus); [**69** (Google Scholar)]

23. CURRENT RESEARCH INTEREST(S)

Prof. Muhammet S. Toprak's research focuses on the development and use of combinatorial synthetic strategies for the fabrication of nanomaterials and nanocomposites for applications in the field of *energy*, *environment*, and *medicine*. He brings together an extraordinarily wide range of complementary skills in the design, fabrication, characterization, and testing of new materials with tailor-made properties. In the field of energy, he has developed nano-engineered *enhanced heat transfer surfaces* for heat exchangers, *using a fabrication strategy mimicking the boiling process*, and demonstrated successfully its implementation. He is among the pioneers in the demonstration of effect of nanoengineering on the improvement of thermoelectric materials' performance. His group has been involved in the development of first prototype of power generators from TE materials to be used in automobiles. In a recent EC funded project his group developed effective heat exchange fluids, i.e. Nanofluids for enhanced heat transfer. Recent work on the medicine side focuses on the design and fabrication of nanoparticles as contrast agents for high resolution XRF bio-imaging, which is a pioneering work in this field as nanoparticles are designed for matching the energy level of the special X-ray source for pre-clinical studies. On the energy side, his group has developed thermoelectric inks which can be printed (or coated) conformally on surfaces to harvest waste heat below 100 ^{o}C. He has major contributions on the nanomaterials for energy conversion, and materials for bio-imaging and have various ongoing activities on the design and fabrication of various nanostructured materials for biomedical, environment and energy related applications. He has authored more than 300 publications (journal and peer reviewed proceedings), started two spin-off companies and has collaborations with academia and industry.

➢ GRANTS

1. Stiftelsen Olle Engkvist Byggmästaren
   Micowave-assistetd synthesis, Processing and 3D Printing of Thermoelectric Materials. *Allocated Budget:* 1 480 000 SEK (2023-2026)

2. **H2020** FET-Open Challenging Current Thinking; 2020-2023 Solid-liquid thermoelectric systems with uncorrelated properties, FET-Project (EU-H2020; 2020-2024) - **UncorrelaTEd**
   Project Partner. Allocated Budget: 374 000 Euro (+20% from KTH) (Total budget: 2 543 322 Euro)

3. Vetenskapsrådet (Swedish Research Council); 2019-2022
   Tuning elektronisk transport av material genom att verka utanför kristallgittret
   Project Leader. Allocated Budget: 2 500 000 SEK

4. Stiftelsen Olle Engkvist Byggmästaren; 2018-2019
   Large-scale Microwave Assisted Heating Reactor for High Throughput (Scale-up) Synthesis of Nanomaterials: Project Leader. Allocated Budget: 850 000 SEK

5. Knut and Alice Wallenberg's Foundation, **KAW**
   Molecular x-ray imaging;
   Project Partner; (Project Coordinator: Prof. Hans Hertz) Allocated Budget: 31 000 000 SEK (2017-2021)

6. Swedish Energy Agency, *Energimyndigheten*
   Low dimensional Materials for Harvesting of Electrical Energy from Waste Heat

Project Leader. Allocated Budget: 3 991 000 SEK (2017-2021)

7. Sweden's Innovation Agency - VINNOVA
   Nanofluids for Lubrication and Heat Transfer - LetsNano
   Project leader. Allocated Budget: 1 900 000 SEK (2016-2017)

8. Swedish Research Council - VR
   Nanofluids for Enhanced Heat Exchange, NanoHex
   Project Leader. Allocated Budget: 2 700 000 SEK (2014-2017)

9. Swedish Research Council – Swedish Research Links (VR-SRL)
   Thermoelectric Energy Harvesting Through Hybrid Materials
   Project Leader. Allocated Budget: 680 000 SEK (2014-2016)

10. Swedish Energy Agency (Energimyndigheten – STEM)
    Fabrication of Nano-engineered Magnesium Silicide (Mg_2Si) Based Thermoelectric Materials
    Project Leader. Allocated Budget: 2 737 000 SEK (2013-2016)

11. Swedish Foundation for Strategic Research - SSF
    Scalable Thermoelectric Materials and Generators
    Project Leader: Muhammet Toprak; Allocated Budget: 16 000 000 SEK (2012-2016)

12. Swedish Research Council -VR/KORANET
    Nanoengineered Thermoelectric Generators for Intermediate Temperature
    Project Leader: Muhammet Toprak. Allocated Budget: 460 000 SEK (2012-2014)

13. Agrisensact – EC-FP7 Project
    A new generation of wireless sensors for integrated precise agriculture
    Project Partner. Allocated budget: 300 000 € (+20% from KTH) (2014-2016)

14. Swedish Research Council - VR (infrastructure)
    A national pulse electric current processing facility
    Co-leader; Project Leader: Prof. L. Bergström. Allocated Budget: 8 000 000 SEK (2013)

15. EU-FP7, NEXTEC
    Next Generation Nano-engineered Thermoelectric Converters – from concept to industrial validation:
    Co-leader. *Allocated Budget:* 900 000 EUR (+20% from KTH) (2011-2014)

16. Swedish Energy Department (STEM)
    Nanoparticles for Energy Conversion by Thermoelectric Materials
    Co-leader. Allocated Budget: 2 400 000 SEK (2009-2011)

17. Sweden's Innovation Agency (VINNOVA)
    Designed Materials – Concept Verification - for our start-up company MicroDeltaT
    Nanostructured macro-porous surfaces for enhanced boiling in heat exchangers
    Co-leader/Co-founder; Project Leader: MicroDeltaT.
    Allocated Budget: 1 200 000 SEK (2009-2011)

18. Sweden's Innovation Agency - VINNOVA-(EU MNT Era-Net)
    Novel generation of polymethacrylate / zinc oxide nanocomposites for advanced applications-NOVAPOL

Co-leader. Allocated Budget: 2 900 000 SEK (2009-2011)

19. EU-FP7, NANOHEX
    Enhanced Nanofluid Heat Exchange
    Co-leader. *Allocated Budget:* 818 600 EUR (+20% from KTH) (2009-2013)

- The following two funds are allocated to **me** personally from *trust funds*:

20. Knut and Alice Wallenberg's Foundation - KAW,
    Micro- Nanotechnology, (2007-2010). Support for Full-position at KTH.

21. Knut and Alice Wallenberg's Foundation - KAW,
    Micro- Nanotechnology, Post Doctoral Studies at UCSB, CA-USA (2005-2007).
    Allocated Budget: 900 000 SEK