

## Şükran ÇAVDAR

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RESEARCH INTERESTS Accelerator Driven Subcritical Reactors;  
Transmutation of fission products and actinides,  
Numerical methods for solving differential equations: BEM, FEM and hybrids with applications to neutron diffusion equations;  
Semi-analytic methods for solving linear/non-linear differential and integro-differential equations: Adomian Decomposition Method, Homotopy Perturbation Method and the Homotopy Analysis Method;  
Integral Neutron Transport Applications;  
High Performance Computing;  
Parallel computing.

EDUCATION **Istanbul Technical University**, Istanbul, TURKEY

*Ph.d. in Nuclear Engineering* **2006**  
“Collaborative Utilization of Boundary Element and Finite Element Methods for the Solution of 2-Dimensional, 2-Groups Neutron Diffusion Equations With Two Regions”  
*Advisor:* Prof. Dr. H.Atilla ÖZGENER, ITU, Institute of Nuclear Energy

*M.Sc. in Nuclear Engineering* **1995**  
“Application of Boundary Elements Method for the Solution of 2-Dimensional 2-Groups neutron diffusion equations”  
*Advisor:* Prof. Dr. H.Atilla ÖZGENER, ITU, Institute of Nuclear Energy

*The English Language Preparatory School* **1992**

*B.Sc. in Electrical Engineering* **1991**  
“The investigation of the variation of fissile and fertile elements in the LWR type reactors with respect to the time”  
*Advisor:* Prof. Dr. Abdi DALFES, ITU, Faculty of Electrical and Electronic Engineering

EXPERIENCE

**The University of Cambridge, Department of Engineering**, Cambridge, UK

<http://www.eng.cam.ac.uk/>

*Visiting Scholar*

**Jan. 2014 - Present**

**Maternity Leave**, Edinburgh, UK

**May. 2011 - Sep. 2013**

**Istanbul Technical University, Institute of Energy**, Istanbul

<http://www.energy.itu.edu.tr>

*Research and Teaching Assistant*

**May. 2003 - Present**

Teaching Assistant, Reactor Theory, Prof.H.A.Özgener, 2009–10.

Teaching Assistant, Computational Methods in Nuclear Engineering, Prof.B.Özgener, 2007–09.

Courses Taught, Fortran Programming, 2007–08.

Teaching Assistant, Engineering Mathematics, Prof.A.Atalay, 2006–07.

Teaching Assistant, Radiation Measurement Lab., Prof.Ş.Gençay, Prof.M.Geçkinli, 1996-2003.

Served in several committees and jobs including:

The Graduate Theses Writing Guidelines Committee of ITU (member, 2009-10).

Developed a web application for the Institute's Library (2006).

The Library Committee of the Institute (head, 2005–10).

The Alumni Committee of the Institute (member, 2005–06).

Designed and coded the nuclear sciences department web site (2005).

The Institute Search and Rescue Team (member, 2004–present).

The Graduate Theses Editorial Committee of the Institute (member, 2003–present).

Developed a programme to Istanbul University for randomly assigning members to docentiate and professorship examination committees (1999).

Developed a student registration software to the Student Administration Office (1999, still in use).

**Arbil, Microsoft Gold Certified Partner**, Istanbul

*Training Consultant*

**Sep. 2006 - May. 2007**

**Istanbul Technical University, Institute of Nuclear Energy**, Istanbul

*Research and Teaching Assistant*

**Jul. 1996 - May. 2003**

**Netron, Microsoft Gold Certified Partner**, Istanbul

*Trainer, Programmer and Project Manager*

**Idea, Microsoft Gold Certified Partner**, Istanbul

*Trainer, Content Manager*

**Microsaray, Microsoft CTC**, Istanbul

*Trainer and Programmer*

**Bilar**, Istanbul

*Trainer*

- S.Ahmetolan, S.Cavdar, Nonlinear degenerate parabolic equations with time dependent singular coefficients, *Mathematische Nachrichten*, 284/10, 2011, 1219-1233.
- B.Özgener, S.Cavdar, H.A.Özgener, The extension of the 2-D element/boundary element hybrid method to general multigroup neutron diffusion theory, *Kerntechnik*, 72/5-6, 2007, 280-286.
- S.Cavdar, H.A.Ozgener, A finite element/boundary element hybrid method for 2-D neutron diffusion calculations, *Annals of Nuclear Energy* 31, 2004, 1555-1582.
- S.Cavdar, H.A.Ozgener, Application Of The Constant Boundary Element Method To The Two Group-Two Dimensional Neutron Diffusion Equation, *Science and Engineering Journal of Fırat University*, 13(1), 2001, 339-344 (in English).

#### **In Preperation**

- Ş.Çavdar, Application Of The Homotopy Analysis Method To Multigroup Neutron Diffusion Equations, 2013.
- Ş.Çavdar, The Adomian Decomposition Method For Multigroup Neutron Diffusion Equations, 2013.
- Ş.Çavdar, Solution Of Multigroup Neutron Diffusion Equations With The Homotopy Perturbation Method, 2013.
- Ş.Çavdar, Chebyshev Acceleration in the Application of the Finite Element/Boundary Element Hybrid Method for 2-D Neutron Diffusion Calculations, 2013.

- Ş.Çavdar, Finding Multiplication Factor in Accelerator Driven Systems by using the Homotopy Perturbation Method, 4. Ulusal Parçacık Hızlandırıcıları ve Uygulamaları Kongresi (4<sup>th</sup> National Congress on Particle Accelerators and Applications), 2010, Bodrum, Turkey (in Turkish).
- Ş.Çavdar, Application Of Adomian Decomposition Method To The One Group Neutron Diffusion Equation, 5<sup>th</sup> International Ege Energy Symposium and Exhibition, 2010, Denizli, Turkey (in English).
- Ş.Çavdar, Homotopy Analysis Method for One Group Neutron Diffusion Equation, 5<sup>th</sup> International Ege Energy Symposium and Exhibition, 2010, Denizli, Turkey (in English).
- S.Büyük, Ş.Çavdar, S.Ahmetolan, Solution of Fixed Source Neutron Diffusion Equation Via Homotopy Perturbation Method, ICAST 2010, Mayıs 2010, Izmir, Turkey (in English).
- Ş.Çavdar, Homotopy Analizi Metodunun Nötron Difüzyonuna Uygulanması (Application of The Homotopy Analysis Method For Neutron Diffusion Calculations), Proceeding of the 10<sup>th</sup> National Congress on Nuclear Science and Technology, 2009, Muğla, Turkey (in Turkish).
- Ş.Çavdar, S.Ahmetolan, M.Üney, Adomian Decomposition Method For Neutron Diffusion Calculations, The Fifth Eurasian Conference on Nuclear Science and its Application, October 2008, Ankara, Turkey (in English).
- Ş.Çavdar, B.Özgener, Multigroup Finite Element-Boundary Element Method For Neutron Diffusion, The Fifth Eurasian Conference on Nuclear Science and its Application, October 2008, Ankara, Turkey (in English).
- Ş.Çavdar, H.A.Özgener, Application Of The Constant Boundary Element Method To The Two Group-Two Dimensional Neutron Diffusion Equation, Türk Fizik Derneği 19. Fizik Kongresi, 2000, Fırat Üniversitesi, Elazığ, Türkiye (in English).

## PROJECTS

- S. Ahmetolan, Ş. Çavdar, Investigation of Doubly Nonlinear Parabolic Partial Differential Equations (Doubly Nonlinear Parabolik Kısmi Türevli Diferansiyel Denklemlerin Çözümlerinin İncelenmesi), İTÜ BAP Project, March 2006 - March 2009.
- S. Hacıyakupoğlu (Project Manager), T.A. Ertek, D.E. Walling, Ç. Ertek, F. Öztürk, C. Fırat, M. Okka, Ş. Çavdar, H. Saygın, N. Çelebi, L. Güreli, G. Karahan, B. Ataksor, S. Akbal, The Use of Cs-137 and Pb-210 Measurements for the Assessment of Soil Erosion and Sedimentation in the Riva Basin (Istanbul, NW Turkey), FAO/IAEA Project, TUR-12330/R0, 9000 TL, 01.11.2002-01.11.2003.

## BOOKS

- Writer, OpenOffice.org: Yeni Tam Kapsamlı Ofis Yazılımınız, Gelecek Yayınları (in Turkish).
- Editor, Makrolarla Excel: Uzman Çözümler, Sistem Yayıncılık.

## TALKS

- Operation of Nuclear Reactors, Enerji'nin ABC'si, Türk Tabipler Birliği, 2008.
- Nuclear Fuel Cycle, Energy Institute, ITU, 2008.

## ACHIEVEMENTS,

## ACTIVITIES AND SKILLS

- Experience on scientific computing, database design and web programming.
- Technical Training (Microsoft Applications Certified Trainer; Search and Rescue Trainer; First Aid Trainer).
- Translated MS Application Training Materials (English to Turkish), edited Microsoft Application Books.
- Writer for various magazines including Eksik Etek Women's Magazine, Ütopiya Liberty of Thought Magazine, Günlerin Getirdiği Literature Magazine, İmago Psychiatry and Sociology Magazine, Technological Education Magazine.
- Content Management (T-SQL, Access, Word, Excel, PowerPoint etc.).
- **Prolific at** Mathematica, MatLab, Fortran, Latex, VB.NET, C ++, C++.NET, C#.NET, Visual Basic Application (VBA), Visual Basic, Transact Structured Query Language (T-SQL), Microsoft SQL, Microsoft Access, Microsoft Word, Microsoft Excel, Microsoft Powerpoint, Microsoft Outlook, Microsoft Project, Microsoft Project Server, Microsoft Share Point Portal, Microsoft Visio, Microsoft Front Page, Open Office, Adobe PhotoShop, Active Server Pages (ASP), ASP.NET, ADO.NET, HTML, XML, Jscript, PHP, MySQL.

## PERSONAL

## DETAILS

*Gender:* Female

*Citizenship:* Republic of Turkey

*Language:* English, German

REFERENCES

Prof. Dr. H.Atilla ÖZGENER  
[www.enerji.itu.edu.tr/Icerik.aspx?sid=9744](http://www.enerji.itu.edu.tr/Icerik.aspx?sid=9744)  
*Ph.D. and MS.c. Thesis Advisor*

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Prof. Dr. Bilge ÖZGENER  
[www.enerji.itu.edu.tr/Icerik.aspx?sid=9745](http://www.enerji.itu.edu.tr/Icerik.aspx?sid=9745)  
*Ms.c. Thesis jury member*

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*We have been acquainted in several courses in ITU.*

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