

## CURRICULUM VITAE

### Personal data:

Name: Maya Gueorguieva Neytcheva  
 Date/place of birth: July 31, 1956, Sofia, Bulgaria  
 Nationality: Bulgarian and Swedish  
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### Educational/Scientific track record:

Secondary school: Varna Mathematical High School, Bulgaria, graduated 1974 with a first class honour diploma (cum laude);

University degree: M.Sc. in Mathematics (Mathematical modelling)- Faculty of Mathematics, Sofia University, Bulgaria, graduated 1979 (cum laude diploma and a golden medal).

Ph.D. degree: Ph.D. student in Mathematics (Numerical Analysis), Faculty of Mathematics and Informatics, University of Nijmegen, The Netherlands; started October 1991, finished October 1995.  
 Thesis title: *Arithmetic and computational complexity of preconditioning methods*, Advisor: Prof. Dr. A.O.H. Axelsson.

Docent in HPC September 27, 2005, Uppsala University, Sweden  
 Professor of HPC January 26, 2016, Uppsala University, Sweden

**Special awards:** Golden Medal from Sofia University (1979) - a distinction given to students with only maximal grades  
 I.B.M. Frye award, given to promising female Ph.D. students at the University of Nijmegen (1994).

### Professional experience:

1979 - 1986 Research Associate at the Institute of Applied Systems Design "SYSTEMISOT", Sofia, Bulgaria;

1986-1991 Research Associate at the Institute of Mathematics, Bulgarian Academy of Sciences, Sofia, Bulgaria;

November 1, 1995 – NCF/NWO Fellowship for scientific training activities, entitled *Scalable and optimal iterative solvers for linear and nonlinear problems*;  
 March 15, 1996  
 May 1, 1996 – Researcher at the Department of Mathematics, Faculty of Mathematics and Informatics (50%);  
 October 15, 1996  
 March 16, 1996 – Post-Doc at NWO, STW Project *High Performance Computing for nonlinear problems in numerical modelling of constructions*, (50%);  
 February 28, 1998  
 Project leader: Prof. A.O.H. Axelsson.

**Professional experience (cont):**

February 1, 1997– July 31, 2001 University lecturer at the Department of Mathematics, Catholic University Nijmegen, The Netherlands.

August, 1, 2001– Dec 31, 2010 Deputy Director of the Swedish National Graduate School in Mathematics and Computing (FMB), Uppsala, Sweden

August, 1, 2001– Senior lecturer (associate professor) at the Department of Information Technology, Uppsala University, Sweden

**Languages:** English (fluently), Russian (fluently), Dutch (used in teaching), Swedish (used in teaching), Bulgarian (mother language)

**Areas of interest and specialization:**

**Numerical Analysis:** Iterative methods for solving discretized partial differential equations - elliptic and parabolic (time-dependent) PDEs, convection-diffusion problems, Stokes and Navier-Stokes problems and indefinite systems; linear elasticity and visco-elasticity, Helmholtz equations  
Robust preconditioners. Parallelization of iterative solution methods.

**Computer Science:** - Parallel architectures and parallel aspects of numerical algorithms;  
- Information systems; Data bases.

**Teaching process:** Computer aided teaching in numerical methods.

**Special qualifications and relevant experience in computers and Informatics:**

**Programming languages and systems:** MATLAB, FORTRAN (77, 90, CM-FORTRAN, CRAFT, HPF), MAPLE, MPI, OpenMP, BSP, PL/1, MUMPS

**Operating Systems:** Unix, Linux, Windows, OS/VS2 MVS (TSO), MUMPS, VM-CMS, MS DOS - IBM PC

**Computers:** experience on: IBM Mainframes and PDP-11 (as a programmer and a system programmer); workstations and symmetric multiprocessors (SMP) (as a programmer); massively parallel computers: CM-2/200/5 and MPP Cray-T3D/T3E, parallel clusters (as a programmer)

**Teaching experience:**

Part-time lecturer at the Center for Computer Training "ISOTSERVICE" and the National Educational Center, Sofia, Bulgaria

Lecturer for the following courses (given at):  
Practical Linear Algebra (Univ. Nijmegen), Finite Difference Methods (Univ. Nijmegen), Supercomputers and Numerical Linear Algebra (Univ. Nijmegen), Numerical Methods in Natural Sciences (Univ. Nijmegen), Algorithms for Parallel Computers (Uppsala Univ.), Analysis of Numerical Algorithms (Uppsala Univ.), Scientific Computing I (Uppsala Univ.), Numerical solution methods for nonlinear problems (Uppsala Univ.), Numerical Linear Algebra (Uppsala Univ.), Computational Methods for Statistics with Applications (Uppsala Univ.), Numerical methods in Scientific Computing (Uppsala Univ.)

**Invited lecturer:**

- 2013 Invited speaker at *Preconditioning of Iterative Methods: Theory and Applications (PIM)*, Prague, Czech Republic, July 2-5
- 2012 Invited speaker at the *Fourth International Conference on Numerical Algebra and Scientific Computing (NASC12)*
- 2010 Invited speaker at the *Nineteenth International Workshop on Matrices and Statistics*, Shanghai, China, from June 5 to June 8
- 2008 Invited speaker at the *Second International Conference on Numerical Algebra and Scientific Computing (NASC08)*, Nanjing Normal University, Nanjing, China, November 2-5
- 2008 Course on *Parallel algorithms, programming in MPI* January 14-18, 2008, Institute of Informatics and Mathematical Modelling, The Technical University of Denmark, Lyngby, Denmark.
- 2000 Course on *Scientific Computing: Parallel algorithms* Institute of Informatics and Mathematical Modelling, The Technical University of Denmark, Lyngby, Denmark, October 2-19
- 1999 Invited lecturer at the *International Conference on Preconditioning Techniques for Large Sparse Matrix Problems in Industrial Applications (Sparse '99)*, Minneapolis, Minnesota, June 10-12
- 1994 Course on *Recent advances in Iterative Methods for solving Algebraic Systems and Eigenvalue Problems*, Leuven, Belgium, March 10  
 O. Axelsson and M. Neytcheva, I: Block diagonal and Schur complement preconditioners. II: The algebraic multilevel iteration method. III: Approximate inverses and their use in preconditioning methods.

**Ph.D. students:**

- Ali Dorostkar *Numerical methods for Glacial Isostatic Adjustment models*, 2012- ongoing.
- Petia Boyanova *On numerical solution methods for block-structured discrete systems*, 2009-2012, completed.
- He Xin *On some numerical methods and solution techniques for incompressible flow problems*, 2008-2012, completed.
- Erik Bångtsson *Robust preconditioners based on the Finite Element framework*, 2002-2007, completed.

**Ms.Sci. students:**

- Shiraz Farouq *Performance comparisons of preconditioned iterative methods for problems arising in PDE-constrained optimization*, 2014 - 2015, finalized.
- Christian Karlsson *Advanced Preconditioners for Adaptive Finite Elements*, 2013 - 2014, finalized.
- Juan Carlos Cabarcas *Enhanced solution methods for viscoelastic problems*, 2012, finalized.
- Xunxun Wu *Preconditioners for the discrete Chan-Hilliard equation in three space dimensions*, Jan 2011, finalized.
- Guanwen Ying *Efficient harmonic simulations of trabecular bone micro finite element models*, 2008-2009, finalized.

Elisabeth Linnér *Sparse Approximate Inverses in a Finite Element Framework*, 2008-2009  
 Niklas Fors *Enhancing Flexibility in Iterative Solution Methods*, 2006-2007  
 Shaman Mahmoudi *Large scale numerical simulations of bone structures*, 2005-2006  
 Kristoffer Karlström *Numerical simulations of linear viscoelastic problems*, 2005-2006

**Editorial work:**

January, 2002 The associate editor of the journal *Numerical Linear Algebra with Applications*, John Wiley & Sons, Ltd.  
 January, 2007 Member of the Editorial board of the *IAENG International Journal of Applied Mathematics*  
 Upon request Reviewer for the journals *SIAM Journal on Scientific Computing*, *IJNME*, *BIT Numerical Mathematics*, *Journal of Computational Physics*, *Journal of Computational and Applied Mathematics*.

**Grants:**

Donation **KAW 2013.0341** from the Knut & Alice Wallenberg Foundation in collaboration with the Royal Swedish Academy of Sciences, supporting Swedish research in mathematics, 2014-2015.

**Participation in research projects:****Project sponsored by the Swedish Research Council (Vetenskapsrådet):**

VR *Finite element preconditioners for algebraic problems as arising in modelling of multiphase microstructures*  
Duration: 2009-2011  
Type of involvement: Project leader

**EU projects:**

NESUS *EU COST Action IC1305 Network for Sustainable Ultrascale Computing*  
Duration: Nov 2013 - ongoing  
Type of involvement: Member of the Management Committee, representing Sweden and STSM coordinator  
 ComplexHPC *EU COST Action IC0805 Open European Network for High Performance Computing on Complex Environments*  
Type of involvement: Member of the Management Committee, representing Sweden  
Duration: May 2010 - June 2013  
Type of involvement: Member of the Management Committee, representing Sweden  
 COPERNICUS *High Performance Computing in Geosciences; Safety of Constructions with Respect to Rock Deformations and Movements*, CP 94-0820 Hipergeos  
Duration: March 1995 - July 1998  
Type of involvement: development and implementation (serial and parallel) of preconditioned iterative methods for linear and nonlinear problems in elasticity; administrative and coordinative work.

- COPERNICUS - *High Performance Computing in Geosciences II; Safety of Constructions with Respect to Rock Deformations and Movements*, 977006 Hipergeos II  
 KIT  
Duration: September 1998 - August 2001  
Type of involvement: development and implementation of preconditioned iterative methods for linear and nonlinear problems in elasticity; administrative and coordinative work.
- INTAS  
*High performance computing in numerical simulations*, 93-377 EXT  
Duration: 1994 - 1999  
Type of involvement: research, administrative and coordinative work.
- INTAS  
*Development of high performance numerical methods for solving stiff multiparameter boundary value problems* RFBR 95-0098  
Duration: 1996 - 2000  
Type of involvement: research, administrative and coordinative work.

**Projects sponsored by the Dutch National Foundation for Computer Resources (NCF):**

- MP-010  
*Preconditioning methods for extremely large scale scientific models*, target computer: Cray T3E at TU Delft, The Netherlands  
Duration: 1997-1998  
Type of involvement: development and implementation of parallel Algebraic Multilevel Iteration techniques, administrative work.
- MP-003  
*Parallel implementation of the Algebraic Multilevel Iteration Method*, target computer: CM-5 at RUG Groningen, The Netherlands  
Duration: 1996-1997
- NCF-CRG-95.28  
*Scalable and Optimal Iterative Solvers for Linear and Nonlinear Problems*, target computer: Cray T3D, Lausanne, Switzerland  
Duration: 1995-1996

**Other projects :**

- Project supported by the Dutch Technology Foundation STW  
 1998 - 2000  
*High performance computing of problems in structural engineering*  
Type of involvement: development and study of nearly optimal order preconditioned iterative methods for problems in 2D and 3D linear elasticity based on domain decomposition techniques and computer implementation (including for parallel computer systems).

Projects supported by the Uppsala Multidisciplinary Center for Advanced Computational Science (UPPMAX)

- 2004 - 2007  
*Numerical solution methods for glacial rebound models*  
 2004 - ongoing  
*Parallel computing in Geosciences*  
Type of involvement: principal coordinator.

Project supported by the Czech Academy of Sciences

- 2005 - 2007  
*Parallel computing in Geosciences*  
 Partner group, Institute of Geonics of the Czech Academy of Sciences, Ostrava

**Organization of conferences/minisymposia/schools:**

- Oct 22-26, 2016 6th International Conference on Numerical Algebra and Scientific Computing, Hangzhou, China
- June 17-19, 2015 International Conference on Preconditioning Techniques for Scientific and Industrial Applications, Eindhoven, Netherlands
- Sept 6-9, 2015 11th International Conference on Parallel and Applied Mathematics, Krakow, Poland
- Oct 25-29, 2014 5th International Conference on Numerical Algebra and Scientific Computing, Shanghai, China
- Sep 28-Oct 4, 2014 International Conference on Computational Methods in Applied Mathematics, Strobl, Austria
- Sept 8-11, 2013 10th International Conference on Parallel and Applied Mathematics, Warsaw, Poland
- June 3-6, 2013 Graduate school '*Heterogeneous computing - impact on algorithms*', organized within the EU COST Action IC0805: Open Network for High-Performance Computing on Complex Environments
- Oct 20-24, 2012 4th International Conference on Numerical Algebra and Scientific Computing, Dalian, China
- June 28-30, 2012 Parallel Matrix Algorithms and Applications, London, UK
- June 6-10, 2011 8th International Conference on *Large-Scale Scientific Computations*", Sozopol, Bulgaria
- June 30-July 3, 2010 6th International Workshop on *Parallel Matrix Algorithms and Applications*, University of Basel, Switzerland
- June 29-July 3, 2009 ENUMATH 2009

**Organization of conferences/minisymposia/schools:**

- June 4-8, 2009 7th International Conference on *Large-Scale Scientific Computations*", Sozopol, Bulgaria
- June 5-9, 2007 6th International Conference on *Large-Scale Scientific Computations*, Sozopol, Bulgaria
- June 6-10, 2005 5th International Conference on *Large-Scale Scientific Computations*, Sozopol, Bulgaria
- June 13-17, 2006 15th International Workshop on *Matrices and Statistics*, Uppsala, Sweden
- June 4-8, 2003 Fourth International Conference on *Large-Scale Scientific Computations*, Sozopol, Bulgaria
- May 20-23, 2001 Conference on *Preconditioned Robust Iterative Solution Methods for Problems with Singularities (PRISM'01)*, Nijmegen, The Netherlands
- August 19-23, 1998 4th International Conference on *Numerical Methods and Applications (NM&A  $O(h^4)$ '98)*, Sofia, Bulgaria
- May 27-29, 1997 International Conference on *Preconditioned Iterative Solution Methods for Large Scale Problems in Scientific Computations (PRISM'97)*, Nijmegen, The Netherlands
- May 19-26, 1997 Summer school on *Multilevel preconditioning methods with parallel implementation aspects and applications in Scientific Computing*, Nijmegen, The Netherlands
- June 13-15, 1996 International Conference on *Algebraic Multilevel Iteration Methods with Applications (AMLI'96)*, Nijmegen, The Netherlands

**Other activities (hobbies):**

I am a passionate skier and practice both downhill and country skiing. As a student I was a participant in the Sofia University country skiing team and have won two bronze medals. I also enjoy hiking in the high mountains. Dancing is my third favourite activity to mention, which comes last only due to time constraints to practice it often enough.