CURRICULUM VITAE

Petter Erling Bjørstad

Personal data:

Name :	Petter E. Bjørstad
Address :	Bergen Center for Computational Science
	Universitetet i Bergen
	Høyteknologisenteret
	N-5008 Bergen, NORWAY
	Email: Petter.Bjorstad@bccs.uib.no
	WWW : http://www.ii.uib.no/~petter/
	Phone: +47-55584171
	Fax : +47-55584295
Home address :	Østre Natlandsfjellet 14
	N-5030 Landås, NORWAY
	Phone: +47-55289138
Date of Birth:	December 6, 1950
Citizenship :	Norwegian
Marital status:	Heidi Bjørstad
Children :	Tor Erling, 1982
	Pål Jørgen, 1989

Education:

M.Sc. in Engineering Physics, The Norwegian Institute of Technology, Trondheim 1975.
Thesis: Analysis of a Non-Linear Inverse Heat Conduction Problem.

Ph.D. in Numerical Analysis and Mathematical Optimization, Stanford University, Stanford 1980.
Dissertation: Numerical Solution of the Biharmonic Equation.

Professional experience:

2010 $\Rightarrow$:	Head of Department of Informatics
2007 - 2008 :	Visiting Professor at the RICAM institute, Johannes Kepler University.
2005 - 2010:	Professor Department of Mathematics University of Bergen.
2002 - 2010 :	Research Director BCCS, Bergen Center for Computational Science.
1986 - 2005 :	Professor Department of Informatics University of Bergen.
1990 - 2001 :	Director Para//ab, Laboratory for Parallel and High Performance Computing.
2000 - 2001 :	Visiting Professor University of Colorado at Boulder.
1996 - 1997 :	Professor of Mathematics, University of Minnesota.
1992 - 1993 :	Visiting Professor Stanford University.
Dec 6. 1985 :	Appointed Professor of Numerical Analysis.
1985 - 1986 :	Principal Research Engineer, Veritas Research.
1981 - 1984 :	Senior Research Engineer, Det norske Veritas, Research Division.
1980 - 1981 :	Associate scientist at the Courant Institute of Mathematical Sciences, New York.

Professional membership:

-Elected member of Academia Europaea (In 2005).
-Elected member of The Norwegian Academy of Technical Sciences (In 1989).
-The Polytechnical Association of Norway.
-Society for Industrial and Applied Mathematics (SIAM).
-SIAM Special Interest Group on Supercomputing.
-Nordiska föreningen for Industriell och Tillämpad Matematik (NORTIM)

Professional activities:

Boards and Committees

2009 - 2013	Chairman of the Board of The Bergen Research Foundation.
2005 - 2009	Member of the Board of The Bergen Research Foundation.
2005 - 2008	Member of the advisory board for e-Infrastructure in Norway.
2007 - 2008	Member of the Board of Trustees of Society of Industrial and Applied Mathematics (SIAM).
2005	Member of the committee to review the guidelines for Ethics at the University of Bergen.
2003 - 2005	Member of the board for the Nordic Data Grid Facility.
2002 - 2003	Member of the board of the University of Bergen.
1999 - 2005	Member of the Scientific Council of CERFACS.
1997 - 2001	Member of the European IT-Prize Evaluation Group.

Editorial work

2004 →	Editor ANACM.
1992 →	Editor BIT.
1991 →	Editor The East West Journal on Numerical Mathematics.
2003 →	Editor The International Journal of
-	High Performance Computing Applications.
1995 - 2003	Co-Editor-in-Chief, The International Journal of
-	High Performance Computing Applications.
1991 - 96	Editor Journal of Numerical Linear Algebra with applications.
1988 - 89	Editor BIT.
1988 - 96	Editor Siam Journal of Scientific Computing.
1987 - 95	Editor Journal on Supercomputer Applications.

Scientific meetings

2010	Chair of the Scientific Committee, China-Sweden-Norway, applied mathematics.
2007 - 08	Member of the Organizing Committee, SIAM Conference on Parallel Processing for Scientific Computing.
1996 →	Member of the Scientific Committee for the International Conferences on Domain Decomposition. 5 years as chairman.
1997 →	Member of the Program Committee for PARA-XX, A bi-annual Nordic parallel computing conference series.
1997 - 98	Member of the Program Committee for an International meeting at Courant Institute, January 1998.
1998 - 98	Participant in the Mittag Leffler Institute, April-June 1998.
1996 - 97	Member of the Program Committee for the 1997 Siam Parallel Processing Conference, Minneapolis 1997.
1995 - 96	Member of the Scientific Committee for the International Conferences on Domain Decomposition.
1994 - 97	Member of the organizing committee for the 1996/1997 special year on High Performance Computing at IMA, Minnesota.
1992 - 95	Member of the Program Committee for the Third International Congress on Applied and Industrial Mathematics, Hamburg 1995.
1993 - 95	Member of the Program Committee for the 1995 Siam Parallel Processing Conference, San Francisco 1995.
1991 -	NAVF/RNF committee for Supercomputing in Norway.
1991 - 92	Steering committee of Supernet in Norway.
1993	Member of international committee to evaluate the Swedish program in high performance computing.
1990 -	Referee for Science Programs of the European commission.
1990 - 91	NAVF/NTNF committee to recommend directions for supercomputing in Norway.
1991 - 95	President NORTIM.
1990 - 91	President of SIAM Nordic Section.
1987 - 89	Vice President of SIAM Nordic Section.

Committees:

Evaluation of INRIA,	Paris, France, March 2004
Evaluation of SFF in Austria,	Lintz, Fall 2003
Evaluation of SFF in Austria,	Vienna, Fall 2002
Professor committee,	University of Linkoping, Linkoping, 2009.
Professor committee,	University of Umeå, Umeå, 2006.
Professor committee,	Royal Institute of Technology, Stockholm.
Professor committee,	Datalogi, University of Copenhagen.
Professor committee,	Høyskolesenteret i Rogaland.
Professor committee,	Numerical analysis, Technical University of Norway.
Professor committee,	Numerical analysis, University of Oslo.
Professor evaluation,	The University in Kiel.

Principal investigator, research grants:

2010 - 2014 (With Talal Rahman), NFR FRINAT, Domain Decomposition Methods, Multiscale problems etc.
2005 - 2008 (With Jarle Berntsen), Non-hydrostatic Ocean General Circulation Models, NFR grant, MARE program.
2004 - 2007 PI/UiB in EU grant, HPC-EUROPA - Pan-European Research Infrastructure for High Performance Computing.
2004 - 2006 PI/UiB in EU grant, EGEE - Enabling Grids for E-sciencE.
2000 - 2004 PI/UiB in EU grant, ENACTS - European Network for Advanced Computing Technology for Science.
2000 - 2004 PI/UiB in EU grant, EURO-GRID - European GRID computing.
1997 - 1999 PI/UiB in EU grant, SISCI - Scalable Coherent Interface technology.
1996 - 1999 PI/UiB in EU grant, PARASOL - Parallel computing, solvers for industry.
1996 - 1998 PI/UiB in EU grant, FRONTIER - Industrial optimal design.
1994 - 1995 PI/UiB ESPRIT grant, EUROPENGER - parallel computing.
1992 - 2005 Norwegian National HPC Center, $>$ 60 mill NOK.
1992 - 1994 A 3.0 mill. US. dollar External Engineering Research Program
grant from Digital Equipment Corporation.

1997-2002 Strategic research program for 'Development,
Analysis, and Implementation of Parallel Algorithms
for Scientific Computing.

1992-1994 Research grants from The Royal Norwegian Council for Scientific and Industrial Research (NTNF), for support
of a laboratory for parallel computing.

1991-1992 Took the initiative to establish a high speed university
network in Norway. Worked in the project group to create it.
This network, Supernet, at 34 Mbit/s was among the first such networks in Europe.

1990 - Research grants from Hydro and Statoil, related to the
development of parallel, industrial software.

1989-1992 Research grants from The Royal Norwegian Council for Scientific and Industrial Research (NTNF), for support
of a laboratory for parallel computing, and industrial projects.

1989-1992 A 4 year grant from the Norwegian Reseach Council
for Science and the Humanities conducting research in parallel
computing, 2.6 Mill. NOK.

1986-1987 Established the first TCP/IP computer network between all
4 universities in Norway. This network subsequently evolved

to the Internet in Norway.

1986-1989 A 3 year grant for research and development of
commercial, parallel software for structural analysis.

Principal organizer of meetings and workshops:

- China-Sweden-Norway-2010, Applied Mathematics.
- ARCADE-2000, European HPC-Center meeting, Bergen, Nov. 2000
- PARA2000, International meeting in Bergen, June 2000
- International Workshop on Parallel Algorithms for PDEs
IMA, June 1997.
- International Workshop on Software for PDEs, IMA, April 1997
- The 9th International Conference on Domain Decomposition
Methods, Hardanger, June 1996.
- Workshop on Scientific Computing with Parallel Computers
Bergen, May 1992.
- Numerical and Applied Mathematics meeting on
Enhanced Oil Recovery, Ustaoset, January 1991.
- International workshop on Domain Decomposition Algorithms
Bergen, August 1988.
- First SIAM Nordic Section Meeting, Bergen, May 1988.

Author of books

1. Domain Decomposition: Parallel Multilevel Algorithms
for Elliptic Partial Differential Equations.
Cambridge University Press, 1996. (with B. Smith and W. Gropp)

Editor of books

1. Proceedings from the SIAM parallel processing conference 1995
2. Proceedings from the SIAM parallel processing conference 1997
3. Proceedings from the 9th Domain Decomposition meeting 1998
4. Proceedings from the IMA workshop on Parallel Algorithms for PDEs 1999
5. Proceedings from the 11th Domain Decomposition meeting 1999

Publications:

1. Analysis of a new algorithm for one-dimensional minimization
(with J. Nocedal) Computing 22, 92-100 1979.

2. Numerical solution of the biharmonic equation. Ph.D. dissertation,
Stanford University 1980.

3. Extrapolation of asymptotic expansions by a modified Aitken formula.
(with G. Dahlquist and E. Grosse) BIT 21, 56-65 1981.

4. Efficient solution of the biharmonic equation. Elliptic Problems Solvers,
edited by M. Schultz 203-217, Academic Press 1981.

5. Fast Numerical Solution of the Biharmonic Dirichlet Problem on
Rectangles, SIAM J. Numer. Anal, Vol. 20, No. 1, 1983.

6. The generalized eigenvalue problem in ship design and offshore industry - a comparison of traditional methods, with the Lanczos process.
(with L. Åsland). Matrix Pencils, edited by B. Kågström and A. Ruhe,
Lecture Notes in Mathematics Vol. 973, 146-155, Springer-Verlag 1983.

7. Solving Elliptic Problems on Regions Partitioned into Substructures.
(with O. Widlund) Elliptic Problem Solvers II, edited by
G. Birkhoff and A. Schoenstadt, 245-255, Academic Press 1984.

8. SESAM'80: A Modular Finite Element System for Analysis of Structures. Proceedings from the IFIP conference PDE Software: Modules, Interface and Systems, Söderkoping, Sweden, Aug. 1983

9. Numerical Solution of a Model Equation Near the Onset of the Rayleigh - Benard Instability. (with W.M. Coughran, H.S. Greenside, D.J. Rose, N.L. Schryer). Elliptic Problem Solvers II, edited by G. Birkhoff and A. Schoenstadt, 531-543, Academic Press 1984.

10. Iterative Methods for the Solution of Elliptic Problems on Regions Partitioned into Substructures. (with O. Widlund).SIAM Journal of Numerical Analysis, vol 23, no. 6 1986.

11. An Algorithm for Numerical Conformal Mapping of Circular Arc Polygons. (with E. Grosse). SIAM Journal on Scientific and Statistical Computing, vol 8, no. 1 1987.

12. Efficient numerical solution of the biharmonic equation in a disk. Notes on Numerical Fluid Mechanics. (1984, Hirschel ed., published by Vieweg)

13. A large scale, sparse, secondary storage, direct linear equation solver for structural analysis and its implementation on vector and parallel architectures. Journal on Parallel Computing, no 5, 1987.

14. Iterative methods for substructured elasticity problems in structural analysis. (with A. Hvidsten). In proceedings from the first international symposium on domain decomposition, Paris January 1987. Published by SIAM 1988.

15. Implementation and performance of the large scale finite element code SESAM on a wide range of scientific computers. The International Journal of Supercomputer Applications. 1987. (with J. Brækhus).

16. Multiplicative and Additive Schwarz' Methods: Convergence in the 2-domain case. In proceedings from the second international symposium on domain decomposition, Los Angeles January 1988. Published by SIAM 1989.

17. On the spectrum of the sum of orthogonal projections with applications in parallel computing. BIT, January 1991. (with J. Mandel).

18. To Overlap or not to Overlap: A note on a Domain Decomposition Method for Elliptic Problems. SIAM J. on Sci. Stat. Comput. 1990. (with O. Widlund).

19. Parallel domain decomposition and iterative refinement algorithms. Notes on Numerical Fluid Mechanics. (1990, Hirschel ed., published by Vieweg) (with R. Moe and M. Skogen)

20. Parallel substructuring algorithms in structural analysis, direct and iterative methods. In proceedings from the forth international symposium on domain decomposition, Moscow May 1990. Published by SIAM 1991.

21. Domain decomposition algorithms of Schwarz type, designed for massively parallel computers. In proceedings from the fifth international symposium on domain decomposition, Norfolk May 1991. Published by SIAM 1992.

22. Efficient Matrix Multiplication on SIMD Computers. SIAM Journal on Matrix analysis and applications, 1992. (with F. Manne T. Sørevik and M. Vajteršic)

23. Two Different Data-Parallel Implementations of the BLAS. In proceedings from NATO advanced workshop, Italy 1992. (with T. Sørevik)

24. Data-parallel BLAS as a basis for LAPACK on Massively Parallel Computers. In proceedings from NATO summer school, Belgium 1992. (with T. Sørevik)

25. Large Scale Structural Analysis on Massively Parallel Computers In proceedings from NATO summer school, Belgium 1992. (with J. Cook)

26. Domain Decomposition, Parallel Computing and Petroleum Engineering. SIAM book on Domain based parallelism, 1994. (with T. Kårstad)

27. Unstructured Grids on SIMD Torus Machines. In proceedings from the Scalable, High Performance Computing Conference, 1994. (with R. Schreiber)

28. Parallel Domain Decomposition Applied to Coupled Transport Equations. In proceedings from the 7th. International symposium on Domain Decomposition Methods 1993. American Mathematical Society, 1994. (with W.M. Coughran and E. Grosse)

29. Domain Decomposition: Parallel Multilevel Algorithms for Elliptic Partial Differential Equations. Cambridge University Press, 1996. (with B. Smith and W. Gropp)

30. A Massively Parallel Reservoir Simulator. In SPE (Society Petroleum Engineers) proceedings, San Antonio, 1995. (with T. Kårstad, M. Espedal and J. Frøyen)

31. Domain Decomposition Techniques in Parallelization of the 3-dimensional FRONTSIM code, in Parallel Programming and Applications, 1995. (with R. Moe, Rudi Olufsen and Eero Vainikko)

32. Experience with industrial applications on MIMD machines, Proceedings from Supercomputer '95, June 22-24, Mannheim, K.G. Saur Verlag

33. Additive Schwarz Methods without Subdomain Overlap and New Coarse Spaces. Proceedings from the 8th International conference on domain decomposition methods, 1996. (With M. Dryja and E. Vainikko)

34. Industrial Computing on MIMD machines, In proceedings from the 1995 NIK meeting.

35. Efficient algorithms for solving a fourth order equation with the spectral-Galerkin method. SISC 1997. (with B. P. Tjøstheim)

36. Parallel implementation of a Schwarz Domain Decomposition Algorithm. Proceedings from PARA96, published as Lecture Notes in Computer Science by Springer. (with M. Dryja and E. Vainikko)

37. Mathematics, parallel computing and reservoirs simulation. Proceedings from the 2nd European Congress of Mathematics, July 1996, Budapest, Hungary. Published by Birkhauser 1998.

38. Multilevel Parallel Solution of Large, Sparse Finite Element Equations from Structural Analysis. Proceedings from HPCN96, published as Lecture Notes in Computer Science, vol. 1067, by Springer. (with J. Brækhus and J. Cook)

39. Robust Additive Schwarz Methods on Unstructured Grids. Proceedings from the 9th International Conference on Domain Decomposition Algorithms, Bergen 1996, to be published by Wiley in 1998.

40. A Coarse Space Formulation with good Parallel Properties for an Additive Schwarz Domain Decomposition Algorithm. Submitted to Numerische Mathematik, (with M. Dryja)

41. A note on high precision solutions of two fourth order eigenvalue problems. Computing, 63:97-107, 1999. (with B. P. Tjøstheim)

42. Additive Schwarz Methods for Anisotropic Elliptic Problems
IMA Volumes in Mathematics and its Applications, Springer-Verlag New York, 2000, pp. 279-294. (with M. Dryja and R. Talal)

43. Parallel Solution of Partial Differential Equations.
IMA volumes on Mathematics and its Applications,
Springer, vol 120, 2000. Editor (with Mitchell Luskin)

44. Efficient Schwarz Methods for Elliptic Mortar Finite Element Problems. Domain Decomposition in Science and Engineering, proceedings from the 13th. Int. Conf. on Domain Decomposition Methods, 2002, pp 303-310. (with M. Dryja and T. Rahman)

45. Additive Schwarz Methods for Elliptic Mortar Finite Element Problems. Numerische Mathematik 95(3):427-457, 2003. (with M. Dryja and R. Talal)

46. A flexible 2-level Neumann-Neumann Method for Structural Analysis Problems.
PPAM 2001: pp 387-394. (with P. Krzyżanowski)

47. Domain decomposition solvers for large scale industrial finite element problems. Lecture Notes in Computer Science 1997, pp. 374-384, Springer-Verlag. (with J. Koster and P. Krzyzanowski)

48. Balancing Domain Decomposition Applied to Structural Analysis Problems.
Advances in Parallel Computing 2003 - 13, pages 845-852. (with J. Koster)

49. The Crouziex-Raviart FE on Nonmatching Grids with an Approximate Mortar Condition.
Siam Journal of Numerical Analysis 2008, vol46, no 1, pp.496-516.
(with T. Rahman and X. Xu)

50. On the relationship between the multiscale finite-volume method and domain decomposition preconditioners.
Computational Geosciences 2008, vol 12, no 3, pp.367-376. Springer Verlag. (with J. M. Nordbotten)

51. A new Coarse Space Formulation for an Additive Schwarz Algorithm.
Manuscript, work in progress, 2009. (with Maksymilian Dryja)

Students:

Master thesis:
- Liv Aasland, Siv. ing. 1982
- Annebeth Askevold, Cand. Scient. 1984
- Erik Boman, Cand. Scient. 1992
- Bjarne Herland, Cand. Scient. 1992
- Pål Hellesnes, Cand. Scient. 1994
- Mohammad Talal Rahman, Cand. Scient. 1994
- Asle Mjanger, Cand. Scient. 1995
- Fredrik G. Brun, Cand. Scient. 1996
- Bjørn Peter Tjøstheim, Cand. Scient. 1996
- Maxim Dmitriev, Master of Science 1996
- Knut Arne Frøland, Cand. Scient. 1998
- Dagfinn Parnas, Cand. Scient. 2001
- Espen Riskedal, Cand. Scient. 2002
- Yngve Solheim, Cand. Scient. 2003
- Einar Skretting Fredriksen, Master 2006
- Mary Kaland, Master 2006
- Christian J. Walde, Master 2006
- Kjetil Nygård, Master 2006

Ph.D. thesis:
- Anders Hvidsten, 1986-1989 Dr. Scient. 1990,
"A parallel implementation of the finite element program SESTRA"
- Morten Skogen, 1987-1991, Dr. Scient. 1992,
"Parallel Schwarz Methods"
- Trond Henning Olesen, 1987-1992, Dr. Scient. 1992,
"Parallel Sparse Matrix Algorithms"
- Randi Moe, 1987-1992, Dr. Scient. 1992,
"Parallel Grid Refinement Algorithms"
- Terje Kårstad, 1990-1993, Dr. Scient. 1993,
"Parallel Oil Reservoir Simulation"
- Eero Vainikko, 1993-1997, Dr. Scient. 1997,
"Robust Additive Schwarz Methods-
Parallel Implementations and Applications"
- Talal Rahman, 1996-2000, Dr. Scient. 2000,
"Analysis of some new Domain Decomposition Methods"
- Bjørn-Peter Tjøstheim, 1996-2000, Dr. Scient. 2000,
"Spectral Methods for Biharmonic Problems"
- Thierry Matthey, 1999-2002, Dr. Scient. 2002,
"Aspects of Framework Design, Parallelization and Force Computation in Molecular Dynamics"

Entrepreneurship:

- Owns Scientific Software Consulting (since 1984)
- Co-founded ICEsoft AS (in 1997), developed it to an international IT-success. The company was sold to Wind River Systems for approx. 250 mill. NOK in 2000.
- Co-founded ICEconsult AS (in 1998), later merged with ICEsoft AS.

Consulting:

- Christian Michelsens Institute
- Veritas Research
- Veritas Sesam Systems
- Statoil
- ITUF
- NTNF
- RIACS / NASA
- AT&T / Bell Labs
- ICEsoft AS
- Wind River Systems, Inc.

Last updated December, 2009