

KONSTANTIN N. LIPNIKOV

CURRICULUM VITAE

Business Address:

Los Alamos National Laboratory
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Education:

- Ph.D. Mathematics, University of Houston, May 2002
Thesis: *Numerical Methods for the Biot Model in Poroelasticity*
Adviser: *Yuri A. Kuznetsov*
- M.S. Mathematics, University of Houston, Fall 2000, GPA 3.94/4.00
- M.S. Applied Mathematics, Moscow Institute of Physics and Technology, 1990,
Moscow Region, RUSSIA

Employment History:

- 01/2005 – *present* *Research Staff Member*
Mathematical Modeling and Analysis Group, Theoretical Division
Los Alamos National Laboratory, Los Alamos, NM
- 06/2002 – 12/2004 *Postdoctoral Research Associate*
Mathematical Modeling and Analysis Group, Theoretical Division
Los Alamos National Laboratory, Los Alamos, NM
- 06/2001 – 08/2001 *Graduate Research Assistant*
Mathematical Modeling and Analysis Group, Theoretical Division
Los Alamos National Laboratory, Los Alamos, NM
- 09/2000 – 05/2002 *Research Assistant*
Department of Mathematics, University of Houston, Houston, TX
- 06/2000 – 07/2000 *Graduate Research Assistant*
Computational Fluid Dynamics Laboratory,
University of Texas, Austin, TX
- 01/1999 – 05/2000 *Research Assistant/Teaching Assistant*
Department of Mathematics, University of Houston, Houston, TX
- 09/1993 – 01/1999 *Research Staff Member*
Institute of Numerical Mathematics, Moscow, RUSSIA
- 09/1990 – 07/1993 *Research Assistant*
Moscow Institute of Physics and Technology, Moscow, RUSSIA

Revised: October 2009

Publications (1996-2009):

Invited:

1. A new discretization methodology for diffusion problems on generalized polyhedral meshes, *Comput. Methods Appl. Mech. Engrg.*, **196** (2007), 3682–3692 (with F.Brezzi, M.Shashkov and V.Simoncini).
2. On discrete boundaries and solution accuracy in anisotropic adaptive meshing. *Engrg. Computers*, (2007), accepted (with Yu.Vassilevski).
3. The error-minimization-based strategy for moving mesh methods. *Communications in Computational Physics*, **1:1** (2006), 53–81 (with M.Shashkov).
4. Hessian recovery method for adaptive mesh generation, *Voprosy Atomnoj Nauki i Tehniki*. Ser. "Mathematical modeling of physical processes", **3** (2006), 37–53 (with Yu.Vassilevski).
5. A node reconnection algorithm for mimetic finite difference discretizations of elliptic equations on triangular meshes, *Communications in Mathematical Sciences*, **3:4** (2005), 665–680 (with M.Berndt, M.Shashkov and P.Vachal).
6. Hessian based anisotropic mesh adaptation in domains with discrete boundaries, *Russian J. Numer. Analysis Math. Modelling*, **20**, No.4 (2005), 391–402 (with V.Dyadechko and Yu.Vassilevski).
7. On control of adaptation in parallel mesh generation, *Engineering with Computers*, **20** (2004), 193–201 (with Yu.Vassilevski).

Peer-Reviewed:

8. Hessian-free metric-based mesh adaptation via geometry of interpolation error, *Computational Mathematics and Mathematical Physics* (2010) **50:1**, 1–15. (with A.Agouzal and Yu.Vassilevski).
9. Mimetic finite difference method for the Stokes problem on polygonal meshes, *J Comp. Phys.*, **228:19** (2009), 7215–7232 (with L.Beirao da Veiga, V.Gyrya and G.Manzini).
10. A Multilevel Multiscale Mimetic (M^3) Method for an Anisotropic Infiltration Problem, *Lecture Notes in Computer Science*, Vol. 5544, Springer-Verlag, 2009, pp.685–694 (with J.Moulton and D.Svyatskiy).
11. Error estimates for a finite element solution of the diffusion equation based on composite norms, *J. Numer. Math.* (2009) **17:2**, 77–95 (with A.Agouzal and Yu.Vassilevski).
12. Convergence analysis of the high-order mimetic finite difference method, *Numer. Math.*, (2009) **113:3**, 325–356. (with L.Beirao da Veiga and G.Manzini).
13. Local flux mimetic finite difference methods, *Numerische Mathematik*, (2009) **112:1**, 115–152 (with M.Shashkov and I.Yotov).

14. Interpolation-free monotone finite volume method for diffusion equations on polygonal meshes, *J. Comp. Phys.* (2009), **228**:3 703–716 (with D.Svyatskiy, and Yu.Vassilevski).
15. Mimetic finite differences for elliptic problems, *M2AN: Math. Model. Numer. Anal.* (2009), **43** 277–295 (with F.Brezzi and A.Buffa).
16. High-order mimetic finite difference method for diffusion problems on polygonal meshes, *J. Comp. Physics* **227** (2008), 8841–8854. (with V.Gyrya).
17. A multilevel multiscale mimetic (M^3) method for two-phase flows in porous media, *J. Comp. Physics* **144** (2008), 6727–6753. (with D.Moulton and D.Svyatskiy).
18. Monotone finite volume schemes for diffusion equations on unstructured triangular and shape-regular polygonal meshes, *J. Comp. Physics* **227** (2007), 492–512 (with M.Shashkov, D.Svyatskiy and Yu.Vassilevski).
19. Convergence of mimetic finite difference method for diffusion problems on polyhedral meshes with curved faces, *M3AS: Mathematical Models and Methods in Applied Sciences*, **16**:2 (2006), 275–297 (with F.Brezzi and M.Shashkov).
20. The error-minimization-based rezone strategy for arbitrary Lagrangian-Eulerian methods, *Numerical Methods for PDEs* **22**:3 (2006), 617–637 (with M.Shashkov).
21. The mimetic finite difference discretization of diffusion problem on unstructured polyhedral meshes, *J. Comp. Phys.* **211** (2006), 473–491 (with M.Shashkov and D.Svyatskiy).
22. Convergence of mimetic finite difference method for diffusion problems on polyhedral meshes, *SIAM J. Numer. Anal.* **43**:5 (2005), 1872–1896 (with F.Brezzi and M.Shashkov).
23. Error bounds for controllable adaptive algorithms based on a Hessian recovery, *Computational Mathematics and Mathematical Physics*, **45**:8 (2005), 1424–1434 (with Yu.Vassilevski).
24. A family of mimetic finite difference methods on polygonal and polyhedral meshes, *M3AS: Mathematical Models and Methods in Applied Sciences* **15**:10 (2005), 1533–1552 (with F.Brezzi and V.Simoncini).
25. A mortar mimetic finite difference method on non-matching grids, *Numer. Math.*, **102**:2 (2005), 203–230 (with M.Berndt, M.Shashkov, M.Wheeler and I.Yotov).
26. Superconvergence of the velocity in mimetic finite difference methods on quadrilaterals, *SIAM J. Numer. Anal.* **43**:4 (2005), 1728–1749 (with M.Berndt, M.Shashkov, M.Wheeler and I.Yotov).
27. Mimetic finite difference method on polygonal meshes for diffusion-type problems, *Comp. Geosciences*, **8** (2004), 301–324 (with Yu.Kuznetsov and M.Shashkov).
28. Mimetic finite difference methods for diffusion equations on non-orthogonal non-conformal meshes. *J. Comp. Phys.*, **199** (2004), 589–597 (with J.Morel and M.Shashkov).

29. Mathematics modeling and numerical algorithms for poroelastic problems, *Contemporary Mathematics*, **329** (2003), 191–202 (with Yu.Kuznetsov, S.Lyons and S.Maliassov).
30. Optimal triangulations: existence, approximation and double differentiation of P_1 finite element functions, *Computational Mathematics and Mathematical Physics*, **43:6** (2003), 827–835 (with Yu.Vassilevski).
31. Nested grid iteration for incompressible viscous flow and transport, *Inter. J. Comp. Fluid Dynamics*, **17:4** (2003), 253–262 (with G.Carey and B.Kirk).
32. Parallel adaptive solution of 3D boundary value problems by Hessian recovery, *Comput. Methods Appl. Mech. Engrg.*, **192** (2003), 1495–1513 (with Yu.Vassilevski).
33. A subspace cascadic multigrid method for mortar elements, *Computing*, **69:3** (2002), 205–225 (with D.Braess and P.Deuffhard).
34. Fast separable solver for mixed finite element methods and applications, *J. Numer. Math.*, **10:2** (2002), 137–155 (with Yu.Kuznetsov).
35. Convergence of mimetic finite difference discretizations of the diffusion equation, *East-West J. Numer. Math.*, **9:4** (2001), 265–284 (with M.Berndt, D.Moulton and M.Shashkov).
36. An efficient iterative solver for a simplified poroelasticity problem, *East-West Journal*, **8:3** (2000), 207–222 (with Yu.Kuznetsov).
37. Adaptive generation of quasi-optimal tetrahedral meshes, *East-West Journal*, **7** (1999), 223–244 (with A.Agouzal and Yu.Vassilevski).
38. An adaptive algorithm for quasi-optimal mesh generation, *Computational Mathematics and Mathematical Physics*, **39** (1999), 1468–1486 (with Yu.Vassilevski).
39. Fictitious domain methods for the numerical solution of three-dimensional acoustic scattering problems, *J. Comp. Acoustics*, **7:3** (1998), 161–183 (with E.Heikkola and Yu.Kuznetsov).
40. 3D Helmholtz wave equation by fictitious domain method, *Russian J. Numer. Anal. and Math. Modelling*, **13** (1998), 371–389 (with Yu.Kuznetsov).
41. Domain decomposition with subdomain CCG for material jump elliptic problems, *East-West Journal*, **6** (1998), 81–100 (with P.Deuffhard).

Under Review:

42. Effective shear viscosity and dynamics of suspensions of micro-swimmers at moderate concentrations. Los Alamos Report LAUR-09-06018 (submitted), (with V. Gyrya, I. Aronson, and L. Berlyand).
43. A mimetic discretization of the Stokes problem with selected edge bubbles. submitted to *SIAM J. Sci. Comput.* (with L.Beirao da Veiga).

44. The mimetic finite difference method for the steady Stokes problem on polyhedral meshes. submitted to *SIAM J. Numer. Anal.* (with L.Beirao da Veiga and G.Manzini).
45. Edge-based a posteriori error estimators for generating quasi-optimal simplicial meshes. submitted to *Math. Mod. Nat. Phenom.*, LA-UR 09-02773, (with A.Agouzal and Yu.Vassielvski).
46. A monotone finite volume scheme for advection-diffusion equations on unstructured polygonal meshes. submitted to *J. Comp. Phys.*, LA-UR 09-03209, (with D.Svyatskiy and Yu.Vassielvski).
47. A new discretization scheme on polyhedral grids for diffusion problems, submitted to *SIAM J. Sci. Comp.* (with J.Morel and S.Runnels).

In Proceedings:

48. Anisotropic mesh adaptation for solution of finite element problems using hierarchical edge-based error estimates, Proceedings of *18th International Meshing Roundtable*, October 25-28, 2009, Salt Lake City, UT. B.Clark (Editor), Springer, pp.595–610. (with A.Agouzal and Yu.Vassilevski).
49. Mimetic finite difference method, Proceedings of *5th International Symposium on Finite Volumes for Complex Applications*, June 8-13, 2008, Aussois, France; R.Eymard, J.-M.Hérard (Editors), Wiley, pp.843–850.
50. Metric tensors for generation of optimal meshes, Proceedings of *Int. Conf. NUM-GRID*, June 10-13, 2008, Computing Center RAS, Moscow, pp.264–271.
51. Generation of quasi-optimal meshes based on a posteriori error estimates, Proceedings of *16th International Meshing Roundtable*, October 15-17, 2007, Seattle, WA. M.Brewer, D.Marcum (Editors), Springer, pp.139–148. (with A.Agouzal and Yu.Vassilevski).
52. Analysis of Hessian recovery methods for generating adaptive meshes, Proceedings of *15th International Meshing Roundtable*, September 17-20, 2006, Birmingham, LA. P.Pebay (Editor), Springer, pp.163–171. (with Yu.Vassilevski).
53. On discrete boundaries and solution accuracy in anisotropic adaptive meshing, Proceedings of *14th International Meshing Roundtable*, September 11-14, 2005, San Diego, CA. Byron W.Hanks (Editor), Springer, pp.313–324 (with Yu.Vassilevski).
54. Parallel adaptive solution of the Stokes and Oseen problems on unstructured 3D meshes, In *Parallel Computational Fluid Dynamics 2003: Advanced Numerical Methods, Software and Applications*, B.Chetverushkin, J.Periaux, N.Satofuka, A.Ecer (Editors), Elsevier B.V, 2004, pp.153–161 (with Yu.Vassilevski).
55. Error estimates for Hessian-based mesh adaptation algorithms with control of adaptivity, Proceedings of *13th International Meshing Roundtable*, September 19-22, 2004, Williamsburg, Virginia, pp.345-351 (with Yu.Vassilevski).

56. On a parallel algorithm for controlled Hessian-based mesh adaptation, *Proceedings of 3rd Conf. Appl. Geometry, Mesh Generation and High Performance Computing*, Moscow, June 28 – July 1, 2004, Comp. Center RAS, Vol.1, pp.154-166 (with Yu.Vassilevski).
57. Moving grids for hyperbolic problems, *Proceedings of the Workshop on Mesh Quality and Dynamic Meshing*, January 16-17, 2003, Sandia National Laboratory, Livermore, CA (with M.Shashkov).
58. Fictitious domain based solvers for particulate flows, *Proceedings of the 13th International Conference on DD Methods*, October 2000, Lyon, France, pp.351–357 (with D.Dashevski, R.Glowinski and Yu.Kuznetsov).
59. Finite element methods with nonmatching grids and applications, *Proceedings of the Conference on Applied Mathematics and Computer Science*, October 28-29, 1996, Moscow, French-Russian A.M.Liapunov Institute, Moscow State University, pp.65–81 (with G.Abdoulaev, Y.Achdou, Yu.Kuznetsov, J.Periaux and O.Pironneau).

Selected Technical Reports:

60. Metric-based control of mesh adaptation in arbitrary Lagrangian Eulerian simulations, Los Alamos Report LAUR-06-4765 (2006) (with Yu.Vassilevski).
61. Moving meshes for the Burgers equation, Los Alamos Report LAUR-03-7605 (2003) (with M.Shashkov).
62. On the application of fictitious domain and domain decomposition methods for scattering problems on Cray Y-MP C98, *Report No.9557*, University of Nijmegen, The Netherlands, 1998 (with Yu.Kuznetsov).
63. On using parallel MIMD computer systems in the inverse problem of acoustic scattering, *RIM-GARC Preprint Series 96-27*, Seoul National University, Seoul, South Korea, June 1996.

Scientific Presentations (2003-2009):

Invited:

1. *A mimetic discretization of the Stokes problem with selected edge bubbles*, Scientific Computing Seminar, Department of Mathematics, University of Houston, September 10, 2009.
2. *Mimetic finite difference method for meshes with curved faces*, International Workshop on Discretization methods for Viscous Flows, Porquerolles, FRANCE, June 2009.
3. *A multilevel multiscale mimetic (M^3) method for two-phase flows in porous media*, The SIAM Conference on Mathematical and Computational Issues in the Geosciences, Leipzig, GERMANY, June 2009.
4. *A multilevel multiscale mimetic (M^3) method for two-phase flows in porous media*, The Mathematics of Finite Elements and Applications (MAFELAP), Brunel University, London, UK, June 2009.
5. *Optimal and quasi-optimal meshes for minimizing the interpolation error and its gradient* SIAM Conference on Computational Science and Engineering, Miami, FL, March 2009.
6. *Mimetic finite difference method for solving PDEs on polygonal and polyhedral meshes*, Dipartimento di Matematica "F.Enriques", Università degli Studi di Milano, Milan, ITALY, December 2008.
7. *Local flux mimetic finite difference method for diffusion problems*, Istituto di Matematica Applicata e Tecnologie Informatiche, Pavia, ITALY, December 2008.
8. *Mimetic finite difference method for solving PDEs on polygonal and polyhedral meshes*, Department of Mathematics, University of Pittsburgh, PA, October 2008.
9. *Mimetic finite difference method for diffusion problems*, Multiphysics Methods Group Seminar, Idaho National Laboratory, September 2008.
10. *Mimetic finite difference method for PDEs*, CCMA PDEs and Numerical Methods Seminar Series, Department of Mathematics, PennState University, May 2008.
11. *Mimetic discretization methods*, Colloquium, Department of Mathematics, Oregon State University, March, 2008.
12. *Mimetic finite difference method for diffusion problems*, Applied Mathematics and Computation Seminar, Oregon State University, March, 2008.
13. *High order mimetic discretizations on finite volume meshes*, Lawrence Livermore National Laboratory, Livermore, December, 2007.
14. *Optimal and Quasi-Optimal Meshes for Numerical Solution of PDEs*, International Conference on Adaptive Modeling and Simulation, Goteborg, SWEDEN, October 2007.

15. *Second-order accurate discretization method for diffusion problems with tensor coefficients on polyhedral meshes*, Sandia National Laboratory, Albuquerque, NM, August 2007.
16. *Optimal and quasi-optimal meshes for numerical solution of PDEs*, Innovative Computing Laboratory, University of Tennessee, Knoxville TN, December 2006.
17. *The new error-minimization-based moving mesh method: theoretical and numerical analysis*, SIAM annual meeting, Boston, MA, July 2006.
18. *The error-minimization-based rezone strategy for arbitrary Lagrangian-Eulerian methods*, Seminar "Applied and Computational Mathematics", Tulane University, LA, January 2005.
19. *Mimetic finite difference methods on unstructured polyhedral meshes*, 8th US National Congress for Computational Mechanics, Austin, TX, July 2005.
20. *Convergence of mimetic finite difference discretizations for diffusion equations*, Workshop on Mimetic Discretizations of Continuum Mechanics, San Diego, CA, July 2003.
21. *Mimetic finite difference methods for diffusion equations on non-orthogonal AMR meshes*, Workshop on Mimetic Discretizations of Continuum Mechanics, San Diego, CA, July 2003.

Conferences:

22. *Anisotropic mesh adaptation for solution of finite element problems using edge-based error estimates*, 18th international Meshing Roundtable, Salt Lake City, UT, October 2009.
23. *Local flux mimetic finite difference method for diffusion problems*, The Mathematics of Finite Elements and Applications (MAFELAP), Brunel University, London, UK, June 2009.
24. *Solving the diffusion and Stokes problems on polygonal and polyhedral meshes*, Finite Element Methods in Engineering and Science (FEMTEC 2009), Granlibakken Conference Center, Lake Tahoe, CA, January 2009.
25. *A mimetic finite-difference method for acoustic-wave modeling on arbitrary meshes*, Annual meeting of the Society of Exploration Geophysicists (SEG), Las Vegas, NV, November 2008.
26. *Hessian-free metric-based mesh adaptation via geometry of interpolation error*, 17th international Meshing Roundtable, Pittsburgh, PA, October 2008.
27. *Generation of quasi-optimal meshes based on a posteriori error estimates*, 16th international Meshing Roundtable, Seattle, WA, October 2007.
28. *Mimetic finite difference methods on polyhedral meshes*, SIAM Conference on Mathematical and Computational Issues in the Geosciences, Santa Fe, NM, March 20, 2007.

29. *Mimetic finite difference methods on generalized polyhedral meshes*, NECDC–14th Joint Laboratory Biennial Conference, Los Alamos, NM, October 2006.
30. *Numerical analysis of Hessian recovery methods for generating adaptive meshes*, 15th International Meshing Roundtable, Birmingham, LA, September 2006.
31. *New discretization methodology for diffusion problems on generalized polyhedral meshes*, LACSI Symposium, Santa Fe, NM, October 2005.
32. *On discrete boundaries and solution accuracy in anisotropic adaptive meshing*, 14th International Meshing Roundtable, San Diego, CA, September 2005.
33. *A family of mimetic finite difference methods on polygonal and polyhedral meshes*, SIAM Annual Meeting, New Orleans, LA, July 2005.
34. *Convergence of mimetic finite difference method for diffusion problems on polyhedral meshes*, SIAM Conf. on Computational Science & Engineering, Orlando, FL, February 2005.
35. *Convergence of mimetic finite difference method for diffusion problems on polyhedral meshes*, LACSI Symposium, Santa Fe, NM, October 2004.
36. *Error estimates for Hessian-based mesh adaptation algorithms with control of adaptivity*, 13th International Meshing Roundtable, Williamsburg, VA, September 2004.
37. *The EMB rezone strategy for ALE methods*, SIAM annual meeting, Portland, OR, July 2004.
38. *Error-minimization-based rezone strategy for ALE methods*, 8th Copper Mountain Conference, Copper Mountain, CO, April 2004.
39. *Mimetic discretizations for diffusion equation on polygonal meshes in Cartesian and cylindrical geometries*, LACSI Symposium, Santa Fe, NM, October 2003.
40. *Moving grids for problems of gas dynamics*, 7th US National Congress on Computational Mechanics, Albuquerque, NM, July 2003.
41. *Robust parallel algorithm for anisotropic adaptive tetrahedral meshes*, 7th US National Congress on Computational Mechanics, Albuquerque, NM, July 2003.
42. *Algebraic multilevel preconditioner with projectors*, 11th Copper Mountain Conference, Copper Mountain, CO, April 2003.
43. *Mimetic finite difference methods for diffusion equations on AMR meshes*, SIAM Conference on Mathematical and Computational Issues in the Geosciences, Austin, TX, March 2003.

Miscellaneous:

44. *Anisotropic mesh adaptation for solution of finite element problems using edge-based error estimates*, Conference "Monge-Kantorovich Optimal Transport Theory and Applications", Santa Fe, NM, October 2009 (poster).
45. *A multilevel multiscale mimetic (M^3) method for two-phase flows in porous media*, ExxonMobil Upstream Research Company, Houston, TX, September 10, 2009.
46. *Mimetic Methods for Solving Diffusion Problems on Polyhedral Meshes*, ExxonMobil Upstream Research Company, Houston, TX, September 2007.
47. *Monotone Finite Volume Methods on Unstructured Triangular and Shape-Regular Polygonal Meshes*, ExxonMobil Upstream Research Company, Houston, TX, September 2007.
48. *A new discretization method for solving pressure equation on arbitrary meshes*, Los Alamos National Laboratory, September 2007.
49. *Mimetic discretizations*, OASCR Applied Mathematics PI Meeting, Livermore, CA, May 2007 (poster).

Workshop Organization:

1. **Co-organizer:** Minisymposium "Advanced Discretization Methods", International Conference "The Mathematics of Finite Elements and Applications", Brunel University, London, June 2009.
2. **Co-organizer:** *Adaptive anisotropic mesh generation: Advances in analysis and practice*, Minisymposium in the SIAM Conference on Mathematical and Computational Issues in the Geosciences, Avignon, France, June 7-10, 2005.
3. **Organizer:** *Moving mesh methods*, Minisymposium in the SIAM Annual Meeting, Portland, OR, July 12-16, 2004.

Panels:

1. *Panel Member:* DOE SciDAC Mid-Term Review of Applied Partial Differential Equations Center (APDEC), Washington DC, April 21, 2009.
2. *Panel Member:* "Research at Fundamental Scales" at Computational Subsurface Sciences Workshop, Washington DC, January 10-12, 2007.
3. *Committee Member:* Los Alamos National Laboratory, Laboratory-Directed Research and Development, Exploratory Research (LDRD/ER), *Mathematics and Computational Science*, 2006.

Journal Referee:

- Journal of Computational Physics
- SIAM Journal on Numerical Analysis
- SIAM Journal on Scientific Computing
- Numerical Methods for PDEs
- Communications in Computational Physics
- Transport in Porous Media
- Applied Numerical Mathematics
- Physics Letters A
- Discrete Applied Mathematics
- Computational Mathematics and Mathematical Physics
- IMA Journal of Numerical Analysis
- International Journal on Finite Volumes
- Engineering with Computers
- Mathematics and Computers in Simulations

The total number of reviewed manuscripts in 2003–2009 is 49.

Academic Activities:

1. mentor of the postdoctoral researcher, Daniil Svyatskiy, 2006–2009
2. mentor of the summer student, Vitaliy Gyrya, 2007, 2008
3. mentor of the summer student, Danail Vassilev, 2006
4. mentor of the summer student, Daniil Svyatskiy, 2005
5. reviewer for "Mathematical Reviews". 20 reviewed articles.

Professional Memberships:

- Society of Industrial and Applied Mathematics (SIAM)
- American Mathematical Society (AMS)

Computing Experience:

- *Numerical Analysis:*

I have 15 years of experience in developing algorithms for the numerical solution of partial differential equations. Knowledge of discretization techniques includes finite differences, finite elements, spectral elements, finite volume methods, etc. Knowledge of iterative solution techniques includes preconditioned Krylov subspace, multigrid and domain decomposition methods.

- *Programming:*

Experience with many languages, including Fortran 90/95, Fortran 77, C, C++, MPI, Matlab, Maple, L^AT_EX, PostScript, HTML, XML. Currently working on two multi-developer projects using the concurrent versions system (CVS) and the version control system (SVN).

References:

Dr. James Hyman, Los Alamos National Laboratory, MS B284, Los Alamos NM, phone: (505) 667-6294, e-mail: hyman@lanl.gov

Prof. Dr. Yuri Kuznetsov, University of Houston, Department of Mathematics, Houston TX, phone: (713) 743-3493, e-mail: kuz@math.uh.edu