## *LIST OF PUBLICATIONS*

### of Gregory Seregin

### Mathematical Problems in Plasticity Theory

1. *On correctness of variational problems of the mechanics of perfect elastoplastic media*, Dokl. Acad. Sci., 1984, v. 276, N1, 71-75 (in Russian). English translation in Soviet Phys. Dokl.

2.*Variational problems and evolution variational inequalities in nonreflexive spaces with applications to geometry and plasticity*, Izv. Acad. Nauk SSSR, Ser. Mat., 48(1984), 420-445(in Russian).

3. *Note on variational formulations of some variational problems in the flow theory of rigidly plastic media*, Prikl. Mat. Mekh., (48)1984, N6, 992-996(in Russian). English translation in J. Appl. Math. Mech.

4. *Variation-difference schemes for problems in the mechanics of ideally elastoplastic media*, Zh. Vychisl. Mat. i Mat. Fiz., 25(1985), 237-253 (in Russian). English translation: USSR Comput. Maths. Math. Phys. 25(1985), 153-165.

5. *Formulation of the problems of the theory of an elastoplastic body*, J. Appl. Math. Mech., 49(1985), N5, 651-659; translated from Prikl. Mat. Mekh., 49(1985), N5, 289-309.

6. *Differential properties of weak solutions of nonlinear elliptic systems arising in plasticity theory*, Mat. Sb. (N.S.), 1986, v.130(172), N3(7), 291-309(in Russian). English translation: Math. USSR Sbornik, 58(1987), N2, 289-309.

7. *Differentiability of local extremals of variational problems the mechanics of perfect elastoplastic media*, Differential'nye Uravneniya, 23(11)(1987), 1981-1991(in Russian). English translation: Differential equations, 23(1987), 1349-1358.

8. *A local Caccioppoli-type estimate for extremals of variational problems in Hencky plasticity*, in Some Applications of Functional Analysis to Problems of Mathematical Physics, Izd. Inst. Math. Akad. Nauk SSSR, Novosibirsk, 1988,127-138.

9. *On differential properties of extremals of variational problems arising in plasticity theory*, Differential'nye Uravneniya, 26(1990), 1033-1044(in Russian). English translation in Differential Equations, 26(1990).

10. *On regularity of weak solutions of variational problems in plasticity theory*, Dokl. Acad. Sci.314(1990), 1344-1349(in Russian). English translation in Soviet Math. Dokl., 42(1991).

11. *On regularity of weak solutions of variational problems in plasticity theory*, Algebra and Analysis, 2(1990), 121-140(in Russian). English translation in Leningrad Math. Journal 2(1991).

12. *Differentiability properties of the stress tensor in perfect elastic-plastic theory*, Preprint UTM 321, Dipartimento di Matematica, Universita degli Studi di Trento, September, 1990.

13. *Existence of a weak solution of the minimax problems in Coulomb-Mohr plasticity*, {Nonlinear evolution equations, 189-220, Amer. Math. Soc. Transl., Ser.2, 164, Amer. Math. Soc., Providence, RI, 1995 (with S.I. Repin).

14. *Differentiability properties of solutions of evolutionary variational inequalities in plasticity theory*, Problemy Matematicheskogo Analiza, Vypusk 12, Izdatel'stvo LGU, 1992, 153-173(in Russian).

15. *On regularity for minimizers of certain variational problems in plasticity theory*, Algebra and Analysis, 4(1992), N5, 181-218(in Russian). English translation in St. Petersburg Math. Journal, 4(1993), N5.

16. *On differentiability properties of the stress tensor in Coulomb-Mohr plasticity*, Albebra and Analysis, 4(1992), N6, 234-252(in Russian). English translation in St.-Petersburg Math. Journal, 4(1993), N6.

17. *A local estimate for maximum of the module of the deviator of the strain tensor in an elastoplastic body with linear hardening*, Zap. Nauch. Semin. Petersburg Odtel. Mat. Inst. Steklov, POMI, 200(1992), 167-176, (in Russian). }

18. *Differentiability properties of weak solutions of certain variational problems in the theory of perfect elastoplastic plates*, Appl. Math. Optim., 28(1993), 307-335.

19. *Remarks on regularity up to the boundary for solutions to variational problems in plasticity theory*, Zap. Nauchn. Semin. Peterburg Odtel. Mat. Inst. Steklov, POMI, 233(1996), 227-232.

20. *Two-dimensional variational problems of plasticity theory*, Isvestiya RAN, Ser. Mat. 60:1 (1996) , 175-210. English translation in Isvestiya Mathematics 60:1 (1996), 179-216.

21. *Regularity for minimizers of some variational problems in plasticity theory*, Zapiski nauchn. seminar. POMI, 243 (1997), 270 - 298 (with T. N. Shilkin).

22. *Regularity for solutions of variational problems in the deformation theory of plasticity with logarithmic hardening*, SFB 256, Preprint 421, Bonn 1995, Proceedings of St. Petersburg Mathematical Society, Vol.5, 1998, pp.184 -222. English translation in Transl. Amer. Math. Soc., Serie II (with J. Frehse).

**Variational Problems in the Theory of Phase Transitions in Solids**

**1.** *On regularity of solutions to variational problems of the theory of phase transitions in elastic body*, **Algebra and Analysis, 7 (1995), no.6, 178-200. English translation in St. - Petersburg Math. Journal, Vol. 7 (1996), no 6, 979 – 1003.**

2. *Uniqueness of solutions to certain variational problems of the theory of phase equilibrium in solids*, Problemy Matem. Analiza, Isd-vo SPb. Gos. Univ. vyp.15, 1995, 200-218. English translation in Journal of Mathematical Sciences, Vol. 80, No. 6, 1996.

3. *On uniqueness and regularity of generalized solutions to variational problems of phase equilibrium in solids*, Russian Dokl. Acad. Sci. 357 (1997), No. 6, 734 -736.

4. *Variational problem on phase equilibrium in solids*, Algebra and Analysis, 10 (1998), no 3, 92 - 132. English translation in St.-Petersburg Math. Journal.

5. *A two-dimensional variational model for the equilibrium configuration of an incompressible, elastic body with a three-well elastic potential*, Journal of Convex Analysis, 7 (2000), no.2, pp. 209--242 (with M. Fuchs).

6. *Local regularity of solutions of variational problems for the equilibrium configuration of an incompressible, multiphase elastic body*, NoDea (Nonlinear Differential Equations and Applications) 8 (2001), pp. 53-81 (with M. Bildhauer and M. Fuchs).

## Variational Problems in Nonlinear Elasticity

1. *Existence and regularity for minimizers of a non-convex variational problem on a set of mappings with non-negative Jacobian*, Universite Paris 7-U.F.R.de Mathematique, Prepublications del'EP0004 "Physique Mathematique et Geometrie", N6, Juin 1993.}

2. *Regularity for weak extremals of a variational problem motivated by nonlinear elasticity*, Bonner Mathematische Schriften, Bonn 1993, Nr.239, 65-69.

3. *Partial regularity for the deformation gradient for some model problem in nonlinear two-dimensional elasticity*, Algebra and Analysis, Vol.6 (1994), No.6, pp.128-153. English translation in St.-Petersburg Math. Journal 6 (1995) no. 6 (with M. Fuchs).

4. *Holder continuity for weak extremals of some two-dimensional variational problems related to nonlinear elasticity*, Advances in Mathematical Sciences and Application , Vol. 17, No. 1 (1997) (with M. Fuchs).

5. *Some remarks on the mollification of piece-wise linear homeomorphizms*, Zap. Nauchn. Seminar. Peterburg. Odtel. Mat. Inst. Steklov, POMI, 221 (1995), pp. 235 - 242 (with T. Shilkin) .

## General Theory of the Calculus of Variations and nonlinear PDE's

1. *Differential properties of solutions of variational problems for functionals with linear growth*, Problemy Matematicheskogo Analyza, Vypusk 11, Izdatel'svo LGU (1990), 51-79 (in Russian). English translation: J. Soviet Math. 64(1993), 1256-1277.

2. *Some remarks on variational problems for functionals with LlnL growth*, Zap. Nauchn. Seminar. Petersburg Odtel. Mat. Inst. Steklov, POMI, Vol. 213, pp.164-178.

3. *A regularity theory for variational integrals with L ln L-growth*, SFB 256, Preprint No. 471, Bonn, 1996, Calculus of Variations and Nonlinear PDE's, 6 (1998), 171 -187 (with M. Fuchs).

4. *$J^1_p$-quasiconvexity and variational problems on spaces of solenoidal vector-valued fields*, Algebra and Analysis, 11(1999)2, pp. 170-217. English translation in St. Petersburg Math. Journal

5. *Full regularity for a class of degenerated parabolic systems in two spatial variables*, Manuscripta Math., 99(1999)4, pp. 517-539 (with J. Frehse).

6. *On backward uniqueness for parabolic equations*, Zapiski Nauchn. Seminar. POMI, 288(2002), 100-103 (with L. Escauriaza and V. Sverak).

7. *On backward uniqueness for parabolic equations*, Arch. Rational Mech. Anal., 169(2003)2, 147--157 (with L. Escauriaza and V. Sverak).

**8.** *Backward uniqueness for the heat operator in half space, Algebra and Analysis*, **15 (2003), no. 1, 201—214 (with L. Escauriaza and V. Sverak).**

**Mathematical Problems in the theory of Newtonian and non-Newtonian fluids**

1. *On the differentiability of local extremals in the mechanics of rigidly viscoplastic media*, Izv. Vyssh. Uchebn. Zaved. Mat., 1987, N10(305), 23-30. English translation in Soviet Math. (Iz. VUZ) 31(1987).

2. *On differential properties of extremals of variational problems in the mechanics of visco-plastic media*, Trudy Mat. Inst. Steklov CLXXXVII, 117-124 (in Russian), English translation in Proceedings Steklov Inst. Math., 1991, Issue 3, 147-157.

3. *On the dynamical system associated with two-dimensional equations of the motion of Bingham fluid*, Zap. Naych. Sem. Leningrad. Otdel. Mat. Inst. Steklov, LOMI, 188(1991), 128-142(in Russian).

4. *On global stability of the two-dimensional visco-plastic flows*, Jyvaskyla-St. Petersburg Seminar on PDE's and Numerical Methods, Ber. Univ. Jyvaskyla Math. Inst., 56(1993), 43-52(with O.A.Ladyzhenskaya).

5. *On semigroups generated by initial-boundary value problem describing two-dimensional visco-plastic flows*, Nonlinear evolution equations, 99-123, Amer. Math. Soc. Transl., Ser.2, 164, Amer. Math. Soc., Providence, RI, 1995 (with O.A. Ladyzhenskaya).

6. *Continuity for the strain velocity tensor in two-dimensional variational problems from the theory of the Bingham fluid*, Preprint no.402, SFB256, Bonn (1995) Italien Journal of Pure and Applied Mathematics, 2(1997), 141-150.

7. *Some remarks on non-Newtonian fluids including non-convex perturbations of the Bingham and Powell-Eyring models for viscoplastic fluids*, Math. Meth. Models in Appl. Sciences, 7 (1998), no 3, 405- 433 (with M.Fuchs).

8. *Regularity results for the quasi-static Bingham variational inequality in dimensions two and three,* SFB 256, Preprint, No. 454, Bonn, 1996, Mathematische Zeitschrift, 227 (1998), 525 – 541 ( with M.Fuchs ).

9. *The flow of the two-dimensional generalized Newtonian fluid*, Algebra and Analysis, 9(1997), No. 1, 163-196, English translation St. Petersburg Math. Journal, 9 (1998), no 1.

10. *On smoothness of solutions to systems describing the flow of generalized Newtonian fluids, and on evaluation of dimensions for their attractors*, Russian Dokl. Acad. Sci., 1997 (with O.A. Ladyzhenskaya).

11. *On smoothness of solutions to systems describing the flow of generalized Newtonian fluids, evaluation of dimensions for their attractors*, Izvestiya RAN, Ser. Mat. 62 (1998), no 1, 59 - 122 ( with O. A. Ladyzhenskaya). English translation in Izvestiya RAN: Ser. Mat. 62:1,59 - 122, 1998.

12. *On attractors for equations describing the flow of generalized Newtonian fluids* , Zapiski Nauchn. Seminar. POMI, 249 (1997), 256 – 293.

13. *Variational methods for fluids of Prandtl-Eyring type and plastic materials with logarithmic hardening*, Math. Meth. Appl. Sci., 22, 317-351 (1999) (with M. Fuchs).

14. *On regularity of solutions to two-dimensional equations of the dynamics of fluids with nonlinear viscosity*, Zapiski Nauchn. Seminar. POMI, 259 (1999), pp. 145-166 (with O. A. Ladyzhenskaya).

15. *Partial regularity for solutions to the modified Navier-Stokes equations*, Zapiski Nauchn. Seminar. POMI, 259 (1999), pp. 238-253.

16. *On disjointness of solutions to the MNS equations*, Amer. Math. Soc. Trancl. (2), Vol. 189, 1999, 159-172 (with O. A. Ladyzhenskaya).

17. *Interior regularity for solutions to the modified Navier-Stokes equations*, J. math. fluid mech., 1(1999), No.3, pp. 235-281.

18. *Partial regularity for suitable weak solutions to the Navier-Stokes equations*, J. math. fluid mech., 1(1999), No.4, 356-387 (with O. A. Ladyzhenskaya).

19. *Global existence of weak solutions for viscous incompressible flow around a moving rigid body in three dimensions*, J. math. fluid mech, 2(2000), no. 3, pp. 219-266 (with M. Gunzburger and H.-Ch. Lee).

20. *Some estimates near the boundary for solutions to the linearized Navier-Stokes equations*, Zapiski Nauchn. Seminar, POMI, 271(2000), pp. 204-223.

21. *On the number of singular points of weak solutions to the Navier-Stokes equations*, Comm. Pure Appl. Math., 54(2001), issue 8, pp. 1019-1028.

22. *Local regularity of suitable weak solutions to the Navier-Stokes equations near the boundary*, J. math. fluid mech., 4(2002), no.1, pp. 1-29.

23. *Differentiability properties of suitable weak solutions to the Navier-Stokes equations*, Algebra and Analysis, 14(2002), No. 1, pp. 193-237.

24. *On solutions to the Navier-Stokes equations with lower bounds on pressure*, Arch. Rational Mech. Anal. 163 (2002) 1, 65-86 (with V. Sverak).

25. *The Navier-Stokes equations and backward uniqueness*, Nonlinear Problems in Mathematical Physics II, In Honor of Professor O.A. Ladyzhenskaya, International Mathematical Series II, 2002, pp. 353--366 (with V. Sverak).

26. *$L_{3,\infty}$-solutions to the Navier-Stokes equations and backward uniqueness*, Uspekhi Matematicheskih Nauk, v. 58, 2(350), pp. 3--44. English translation in Russian Mathematical Surveys, 58(2003)2, pp. 211-250 (with L. Escauriaza and V. Sverak).

27. *Remarks on regularity of weak solutions to the Navier-Stokes equations near the boundary*, Zapiski Nauchn. Seminar, POMI, 295(2003), pp. 168-179.

28. *Ol'ga Alexandrovna Ladyzhenskaya (on her 80$^{th}$ birthday),* Russ. Math. Surv., 2003, 58(2), pp. 395-425 (with N.N. Ural'tseva).

29. *On smoothness of $L_{3,\infty}$-solutions to the Navier-Stokes equations up to boundary*, Preprint PDMI-16/2003, Mathematische

Annalen, 332(2005), pp. 219-238.

30. *Regularity results for parabolic system related to a class of non-Newtonian fluids,* Ann. I. H. Poincare—AN 21 (2004), pp. 25-60 (with E. Acerbi and G. Mingione).

31. *Boundary partial regaularity for the Navier-Stokes equations*, Zapiski Nauchn. Seminar, POMI, 310(2004), pp. 158-190 (with T. Shilkin and V.Solonnikov).

32. *Olga Alexandrovna Ladyzhenskaya (1922—2004),* Notice of AMS, 2004, vol. 51, no. 11, pp. 1320-1331 (with Susan Friedlander, Peter Lax, Cathleen Morawetz, Louis Nirenberg, Nina Ural'tseva, and Mark Vishik).

33. *Navier-Stokes equations: almost $L_{3,\infty}$-cases*, Journal of mathematical fluid mechanics, 9(2007), pp. 34-43.

34. *New version of Ladyzhenskaya-Prodi-Serrin condition,* Algebra i Analiz, 18 (2006), No: 1 (in Russian), English translation: St.Petersburg Math Journal, 18(2007), No.1, pp. 89-103.

35. *New Sufficient Conditions of Local Regularity for Solutions to the Navier-Stokes Equations*, Journal of mathematical fluid mechanics, first on-line (with A. Mahalov and B. Nicolaenko).

36. *A sufficient condition of local regularity for the Navier-Stokes equations*, Zapiski Nauchn. Seminar, POMI, 336(2006), pp. 46-54 (with W. Zajaczkowski).

37. *Estimates of suitable weak solutions to the Navier-Stokes equations in critical Morrey spaces*, Zapiski Nauchn. Seminar, POMI, 336(2006), pp. 199-210.

38. *Weak solutions to the Cauchy problem for the Navier-Stokes equations satisfying the local energy inequality*, AMS translations, Series 2, Volume 220, pp. 141-164 (with N. Kikuchi).

39. *A global nonlinear evolution problem for generalized Newtonian fluids: Local initial regularity of the strong solution*, Computers and Mathematics with applications, 53(2007), pp. 509-520 (with M. Fuchs).

40. *On local regularity of suitable weak solutions to the Navier-Stokes equations*, accepted for publications in Uspekhi Matemat. Nauk (Russian Mathematical Surveys)

41. *A sufficient condition of regularity for axially symmetric solutions to the Navier-Stokes equations*, accepted for publication in SIMA, (with W. Zajaczkowski )

42. *Local regularity theory of the Navier-Stokes equations*, Handbook of Mathematical Fluid Mechanics, Vol. 4, Edited by Friedlander, D. Serre, pp, 159-200

## Finite Element Method

1. *Variation-difference scheme for problems in the mechanics of ideally elastoplastic media*, Zh. Vychisl. Mat. i Mat. Fiz, 25(1985), 237-253(in Russian). English translation: USSR Comput. Maths. Math. Phys.25(1985), 153-165.

2. *On some variation-difference scheme for problems of limit analysis*, Zh. Vychisl. Mat. i Mat. Fiz., 27(1987), 83-929 (in Russian). English translation in USSR Comput. Maths. Math. Phys.

3. *On some way of the approximation of solutions to initial -boundary value problems for Navier-Stokes equations*, Zap. Nauch. Semin. Petersburg. Otdel. Mat. Inst. Steklov, POMI, 197(1992), 87-119(in Russian) (with O.A. Ladyzhenskaya).

4. *A dual finite element approach for stresses of elasto-perfectly plastic body*, Jyvaskyla - St.Petersburg Seminar on PDE's and Numerical Methods, Ber. Univ. Jyvaskyla Math. Inst., 56(1993), 101-114 (with P. Neittaanmaki and V. Rivkind).

5. *Error estimates for stresses in the finite element analysis of the two dimensional elasto-plastic problems*, Int. J. Engng. Sci. Vol. 33, No. 2, pp. 255-268, 1995 (with S. Repin).

6. *About optimal shape design in fluids dynamics*, Optimal Control Appl. Methods, 16(1995), no 2, 143-148 (with P. Neittaanmaki, V.Ya. Rivkind).

7. *somewhat*, Mathematics of Computations ( with P. Neittaanmaki and V.Rivkind).

## Monographs

1. *Variational Methods for Problems from Plasticity Theory and from the Theory of Generalized Newtonian Fluids*, Lecture Notes in Mathematics, Springer, 1749 (with M. Fuchs).