Curriculum Vitae of Professor Irina Markina

Personal data:
Name: Irina Markina
Date of birth: December 4, 1963
Place of birth: Kemerovo, Russia
Sex: Female
Nationality: Norwegian and Russian
Present position: Full Professor, University of Bergen.

University address: Department of Mathematics, University of Bergen,
Allegaten 41, N-502 Bergen, Norway
e-mail: irina.markina@uib.no
phone: 47 555 82 853
fax: +47 555 89 672

Fields of interest:
Real Analysis, PDE, Quasiconformal and quasiregular mappings, Non-linear potential theory,
Sub-Riemannian and Sub-semi-Riemannian Geometry, Control Theory, Mathematical Physics,
Lie algebras and groups

Education:
Graduated from the Novosibirsk State University in 1986

Degrees:
M.Sci. June 3, 1986, in the Novosibirsk State University, Special studies in Advanced Mathematics.
Thesis title: "Change-variable formula for functional spaces with fractional derivatives".
Ph.D., November 15, 1995, in the Sobolev Institute of Mathematics of the Siberian Branch of the Russian
Academy of Sciences, Thesis title: "Nonlinear potential theory of subelliptic equations", supervisor
Professor S.K. Vodopyanov.

Employment:
2008-present: Full Professor, University of Bergen, Norway.
2008: Associate Professor, University of Bergen, Norway.
2007-2008: Researcher, UNIFOB AS v/ Unifob petroleum (temporary position), University of Bergen,
Bergen, Norway.
2006: Associate Professor (temporary position), University of Bergen, Bergen, Norway.
2005: Full Professor, University of Valparaiso, Valparaiso, Chile.
2001-2005: Visiting Professor, Department of Mathematics of Technical University Federico Santa
Maria, Valparaiso, Chile.
2000: Research Fellow, The Mittag-Leffler Institute, Stockholm, Sweden.
1999-2000: Associate Professor, Department of Mathematics, Siberian State University of
Telecommunication and Information, Novosibirsk, Russia.

1996-1999: Assistant Professor, Department of Mathematics, Novosibirsk State University, Russia.
1991-1996: Assistant Professor, College of Informatics, Novosibirsk State University, Russia.
1986-1991: Post-graduate course, Sobolev Institute of Mathematics, of the Siberian Branch of   the Russian Academy of Sciences, Novosibirsk, Russia.

Languages:
Russian, English, Spanish, Norwegian, all fluent

Grants as PI:
2017-2018: Bilateral grant NFR-DAAD for the international collaboration between analysis group at Leibnitz University of Hannover and University of Bergen
2016: Grant SPIRE for international collaboration, University of Bergen, Norway
2010, 13, 17: Grant from Meltzerfondet for Travel, University of Bergen, Norway
2014: Grant from Sasakawa foundation for cooperation between Norway and Japan, Norway
2011-2014: Norwegian Research Council, FRINAT 204726/V30, Norway
2010: Abel/Munch Extraordinary Chair, Visiting Research, Norway-Spain.
2008: Grant of NordForsk for Research Groups Network "Analysis and Application", (main coordinator) Norway.
2007: Grant NFR – Bilat USA-Norway. (Norwegian Research Council) # 180275/D15, Norway.
2005: Grant FONDECYT # 7050181 – International cooperation, Chile.
2004: Grant FONDECYT # 7040027 – International cooperation, Chile.
2004-2007: Grant FONDECYT # 1040333 – Council for the Development of Science and Technology of Chile, Chile.
2003: Grant FONDECYT # 7030010 – International cooperation, Chile.
2002-2003: Grant FONDECYT # 1020067 – Council for the Development in Science and Technology of Chile, Chile.
1996-1997: Grant of Russian Ministry of Superior Education for participation of young researchers in International Conferences, Novosibirsk State University, Novosibirsk,   Russia.

Other Professional Activities:

1.Managing Editor of the Journal "Analysis and Mathematical Physics",
http://www.springer.com/birkhauser/mathematics/journal/13324
2.Editor of the Journal "CUBO", http://www.scielo.cl/scielo.php?script=sci_serial&pid=0719-0646&lng=es&nrm=iso

2018-present: Leader of the research group "Analysis and PDE" Department of Mathematics, University of Bergen, Norway
2010-present: Responsible for the Department's Mathematical Colloquium, Department of Mathematics, University of Bergen, Norway.
2003-2005: Responsible for the Department's Mathematical Colloquium, Technical University Federico Santa Maria, Valparaiso, Chile.
1996-2000: Administrative assistant, Division of Mathematical Analysis, Department of Mathematics, Novosibirsk State University, Russia.
1992-1995: Administrative assistant at the College of Informatics, Novosibirsk State University, Russia.

Professional Membership:
A member of the American Mathematical Society since 2001.
A member of the Mathematical Society of Chile 2001-2006.

Organization of schools for young researchers:
2019: Main Organizer of the summer school in "Analysis, Geometry and PDE", June 31- July 05, Nordfjordeid, Norway
2018: Main Organizer. Winter School "Geometry, Analysis and Physics" March 4-10, 2019, Geilo, Norway
2022,2019,16,15,13,11: Member of the Scientific Committee of the CIME-CIRM Course on New Trends on Analysis and Geometry in Metric Spaces (12-7-th School on Analysis and Geometry in Metric Spaces), Levico Terme (Trento)
2013: The main organizer of the Norwegian School in Analysis and Mathematical Physics", Bergen, Norway, 24-29 June.
2009: The main organizer of the "Norwegian Fall School in Analysis for PhD Students and Young Researchers" Trondheim, September 10-13.

Organization of scientific conferences:
2020: Organizer of the One day seminar on Analysis, Geometry and PDE, October 30, Bergen,
2018: Member of the Organizing Committee of the First National Meeting of Mathematicians, September 12-14, 2018, Bergen,
2019: Member of the organizing committee Abel Symposium, June 23-29, Ålesund, Norway,
2018: Organizer of the One day seminar on Analysis, Geometry and PDE, October 21, Bergen,
2016: Organizer of the International conference "Geometric Analysis in Control and Vision Theory" 9-14 May, Voss, Norway
2014: Organizer of the Thematic day "On sub-Lorentzian Geometry" during the research trimester " Geometry, Analysis and Dynamics on sub-Riemannian manifolds" at the Institute of Henry Poincare, Paris, November 12. (web page http://folk.uib.no/ima083/subLor.html)
2013: Organizer of the mini-symposium "Geometric control and applications" and the thematic section "Applied analysis and geometry" on the international conference ICAMI 2013, San Andres Island, Colombia
2011: Member of the Scientific Committee of the "NCTS Taiwan-Norway Joint Workshop on Analysis and its Applications", Hsinchu, Taiwan, 7-10 June.
2010: One of the organizers of the International Conference "Complex Analysis and Mathematical Physics", Chillan, Chile, December 12 – 16.
2008: Member of Organizing Committee of Joint Workshop in Complex Analysis and Mathematical Physics, June 9-13, 2008, Nordfjordeid, Norway
2007: Member of Organizing Committee of International Conference "New trends in Complex and Harmonic Analysis" May 7-12, 2007, Voss, Norway

International scientific panels for research projects:
2020: Leader of the panel, Finish Academy of Science, Finland.
2019, 2018: Member of the panel, Finish Academy of Science, Finland
2018, 2011: Chilean Research Council (FONDECYT), Chile.
2021,2020,2019,2017,2017,2016,2015: Research Grant Council (RGC), Hong Kong

International hiring and/or promotion comity on a position:
2021: Professor position, Uppsala University, Sweden.
2019: Promotion from an Assistant Professor to an Associate Professor position, Aalto University School of Science, Finland
2019: Associate and Full Professor positions for the didactic group on the Mathematical Department, University of Bergen, Bergen, Norway.
2017: Promotion from an Associate Professor to Full Professor position, Akershus University College of Applied Sciences (HiOA), Norway
2017: Promotion from an Associate Professor to Full Professor position, University of Stavanger, Norway

2015: Associate Professor, Arctic University of Norway, Tromsø, Norway.
2015: Associate/Full Professor, Stockholm University, Sweden.
2013: Promotion from an Assistant Professor to an Associate Professor position, Hong Kong Baptist University
2012: Senior Lecture in Mathematics, University of Gotheburg, Sweden

I participated in more than 70 scientific conferences since 1994.

Teaching experience

Supervision over Ph.D theses:
4. 2014-2017: "Analytical,combinatorial and topological properties of quadratic differentials and their applications" Anastasia Frolova, Defended 12.10.2017.
3. 2011-2014: "H-type algebras and sub-Riemannian cut locus", University of Bergen, Norway, Christian Autenried. Defended 13.02.2015.
2. 2009-2011: "Sub-Riemannian structure on spheres S^3 and S^7 ", University of Bergen, Norway, Mauricio Godoy. Defended 29.04.2012.
1. 2008-2010: "Sub-semi-Riemannian geometry on Heisenberg-type groups", University of Bergen, Norway, Anna Korolko. Defended 04.02.2011.

Supervision over the postdoc:
2012-2014: postdoctoral fellow Mahdi Salehani.

Supervision over Master Science theses:

16. 2019-2022: "Isometries of pseudo-H-type algebras", John Otto Pleksten, University of Bergen, Norway.
15. 2020-2022: "Integrability: geometric and analystic aspects", René Langøen, University of Bergen, Norway.
14. 2017-2019: "Cartan Geometry for sub-Riemannian manifolds", Jonatan Stava, University of Bergen, Norway.
13. 2017-2019: "Optimal curve for the rolling of the hyperboloid on the plane.", Sven Ivan Idland Bokn, University of Bergen, Norway.
12. 2017-2019: "Dammek-Ricci spaces associated to the pseudo H-type algebras", Jorge Luis Lopez Marin, University of Bergen, Norway.
11. 2016-2018: "Model spaces on Carnot groups", Eirik Berge, (co-supervising with E.Grond). University of Bergen, Norway.
10. 2016-2018: "Modules of measures on Carnot groups", Anja Eidsheim, University of Bergen, Norway.
9. 2015-2017: "Geometric and Spectral Properties of Hypoelliptic operators", Stine Maria Eik Knarvik, University of Bergen, Norway (co-supervising with A.Vasiliev and Erlend Grong).
8. 2015-2017: "Radon-Hurwitz-Eckmann function: theory and algorithmic support", Kim-Erling Bolstad-Larssen, University of Bergen, Norway.
7. 2015-2017: "Automorphism group of pseudo H-type algebras", Francesca Azzolini, University of Bergen, Norway.
6. 2015-2017: "Extremal problems in complex analysis", Bhagyashri Nilesh Ingale, University of Bergen, Norway.
5. 2011-2012: "The Alexandrov Topology in Sub-Lorentzian Geometry", Stephan Wojtowytsch (join master thesis with Heidelberg University, Germany)
4. 2010-2011: "Structure of infinite dimensional Grasssmannian" Christian Autenried (join master thesis with Ludwig-Maximilians Universitat Munchen, Germany)

3. 2009-2011: "Quasiconformal maps of 3 dimensional sphere", University of Bergen, Norway, Ksenia Lavrichenko

2. 2009-2011: "Some Regularity Results for Quasiregular Mappings on Heisenberg group and Sub-elliptic Equations", University of Bergen, Norway, Quifan Lie.

1. 2004-2005: "Saffman-Taylor instabilities in channel and wedge flows" (Technical University Federico Santa Maria, Valparaiso, Chile.) Rodrigo Meneses.

Supervision over Bachelor theses:

14. 2021: "Rectifiability in light of geometric measure theory", Martin Mossige, University of Bergen, Norway,

13. 2021: "From continuity to differentiability", Erik Jensson, University of Bergen, Norway,

12. 2020: "A brief look at measure-theoretical probability", Øyvind André Hermansen, University of Bergen, Norway,

11. 2019: "On the Gauss-Bonnet theorem", Kristian Andre Jacobsen, University of Bergen, Norway

10. 2019: "From Riemann to Lebesgue integration", John Otto Pletten, University of Bergen, Norway

9. 2018: "Rolling balls and hyperboloid of the plane" Lloyd Andreassen, University of Bergen, Norway

8. 2017: "Rolling maps: kinematic and geometric features" Sven Ivan Idland Bokn, University of Bergen, Norway

7. 2017: "Hausdorf measure versus capacity" Jonatan Stava, University of Bergen, Norway

6. 2015: "Hausdorff outer measure: theory and application", Anja Eidsheim**,** University of Bergen, Bergen, Norway.

5. 2015: **"**Rademacher theorem and fundamental theorem of calculus", Stine Eik Knarvik, University of Bergen, Bergen, Norway.

4. 2012: "Hausdorff Measure", Joakim Alme Nordstrand, University of Bergen, Bergen, Norway.

3. 2012: "The development of numbers and tests for convergence of positive and alternating series", David T. Lewis, University of Bergen, Bergen, Norway.

2. 2011: "The Geometry behind the Special Relativity Theory", Paul Antony Frontéry, University of Bergen, Bergen, Norway.

1. 2010: "Exploration of real numbers", Solveig G Lunde, University of Bergen, Bergen, Norway.

Lectures during the ERASMUS exchange visits:

2018: 8 hours course for postgraduate students, University of Coimbra, Portugal

2017: 10 hours course for graduate students, University of Bologna, Italy

Courses on the international schools (postgraduate level):

2018: Mini course "On pseudo H-type Lie Algebras", at the center of Advanced studies, Novosibirsk State University, Novosibirsk, Russia, October 3-6.

2015: Lecturers on the Summer School "Analytic, Algebraic and Geometric Aspects of Differential Equations", Bedlewo, Poland, September 06-12.

2011: Lecturers on the Summer School "Mathematical Structures in Modern Quantum Physics", Göttingen, Germany, August 29 – September 2.

Undergraduate and graduate courses:

1991-1995: Elementary Mathematics (6 credits, 3 groups), practical exercises for undergraduate students, School of Systems in Informatics, College of Informatics, Novosibirsk State University, Russia.

1993-1995: Mathematical Analysis (5 credits), practical exercises for undergraduate students, School of Systems in Informatics, College of Informatics, Novosibirsk State University, Russia.

1995-1998: Mathematical Analysis (5 credits), practical exercises for undergraduate students, Department of Physics, Novosibirsk State University, Russia.

1996-2000: Mathematical Analysis (5 credits), practical exercises for undergraduate students, Department of Mathematics, Novosibirsk State University, Russia.

1997-1999: "Elements of non-linear potential theory". Special course (10 credits) for graduate students at the Department of Mathematics, Novosibirsk State University, Russia.

1998-2000: Analytic Geometry and Linear Algebra (lectures 10 credits and practical exercises (5 credits) for undergraduate students, Department of Informatics, Siberian State University of Telecommunication and Information, Russia.

1998-2000: Elements of Higher Mathematics (5 credits), practical exercises for undergraduate students, Department of Informatics, Siberian State University of Telecommunication and Information, Russia.

2001 (March - July): Analysis-II, (10 credits), lectures for undergraduate students, Department of Mathematics, Technical University Federico Santa Maria, Chile.

2001 (July - November): Calculus-IV, (10 credits), lectures for undergraduate students, Department of Mathematics, Technical University Federico Santa Maria, Chile.

2001 (July - December): Ordinary Differential Equation, (10 credits), lectures for undergraduate students, Faculty of Science, University of Chile, Chile.

2001 (July - December): Calculus-II, (10 credits), lectures for undergraduate students, Faculty of Science, University of Chile, Chile.

2002 (March - July): Calculus-IV, (10 credits), lectures for undergraduate students, Department of Mathematics, Technical University Federico Santa Maria, Chile.

2002 (March - July): Calculus-II, (10 credits), lectures for undergraduate students, Department of Architecture, Technical University Federico Santa Maria, Chile.

2002 (July - December): Analysis-II, (10 credits), lectures for graduate students, Department of Mathematics, Technical University Federico Santa Maria, Chile.

2002 (July - December): Calculus-II, (10 credits), lectures for undergraduate students, Department of Architecture, Technical University Federico Santa Maria, Chile.

2003 (March - July): Calculus-I, (10 credits), lectures for undergraduate students, Department of Architecture, Technical University Federico Santa Maria, Chile.

2003 (March - July): Analysis-I, (10 credits), lectures for graduate students, Department of Mathematics, Technical University Federico Santa Maria, Chile.

2003 (July - December): Analysis-II, (10 credits), lectures for graduate students, Department of Mathematics, Technical University Federico Santa Maria, Chile.

2004 (March - July): Analysis-I, (10 credits), lectures for graduate students, Department of Mathematics, Technical University Federico Santa Maria, Chile.

2004 (July - December): Analysis-II, (10 credits), lectures for graduate students, Department of Mathematics, Technical University Federico Santa Maria, Chile

2005 (March - July): Calculus-I, (10 credits), lectures for undergraduate students, Department of Engineering, Technical University Federico Santa Maria, Chile.

2005 (March - July): Complex Variables, (10 credits), lectures for undergraduate students, Department of Mathematics, University of Valparaiso, Chile.

2005 (August - December): Differential Geometry of Curves and Surfaces (10 credits), lectures for undergraduate students, Department of Mathematics, University of Valparaiso, Chile.

2006 (January - June): Complex Variables, (10 credits), lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2006 (August - December): Stability and Perturbation theory, (10 credits), lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2007 (August – December): General Functional Analysis (10 credits) lectures for graduate students, Department of Mathematics, University of Bergen, Norway.

2008 (August – December): Measure theory (10 credits) lectures for graduate students, Department of Mathematics, University of Bergen, Norway.

2009 (January – June): Measure theory (10 credits) lectures for graduate students, Department of Mathematics, University of Bergen, Norway.

2009 (August – December): Real Analysis (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2010 (January – June): Special topics in Analysis: Lie group theory (15 credits) lectures for graduate and post graduate students, Department of Mathematics, University of Bergen, Norway.

2010 (August – December): Real Analysis (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2011 (January – June): Special topics in Analysis: Distribution theory and Sobolev Spaces (15 credits) lectures for graduate and post graduate students, Department of Mathematics, University of Bergen, Norway.

2011 (January – June): Measure theory (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2012 (January – June): Differential Geometry (10 credits) lectures for graduate students, Department of Mathematics, University of Bergen, Norway.

2013 (January – June): Linear algebra (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2013 (August– December): Real analysis (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2014 (January – June): Linear algebra (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2014 (August– December): Topology (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2015 (January – June): Algebra (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2015 (January – June): Representation theory (15 credits) lectures for graduate and postgraduate students, Department of Mathematics, University of Bergen, Norway.

2016 (January – June): Advanced topics in Analysis: Geometric Lie theory and representation" (15 credits) lectures for graduate students, Department of Mathematics, University of Bergen, Norway.

2017 (January – June): Calculus (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2017 (August – December): Complex analysis (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2018 (January – June): Bachelor project course (10 credits) for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2018 (August – December): Real Analysis (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2018 (August – December): Tensor Analysis (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2019 (January – June): Linear algebra (10 credits) for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2019 (January – June): Special topics in Analysis: Representation of Lie algebras and Lie groups (15 credits) for graduate and postgraduate students at the Department of Mathematics, University of Bergen, Norway.

2020 (October-January) Sub-Riemannian geometry for graduate students, Department of Mathematical Physics, Julius-Maximilians University of Wurzburg, Germany

2020 (January – June): Linear algebra (10 credits) for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2021 (August – December): Tensor Analysis (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2021 (January – June): Linear algebra (10 credits) for undergraduate students, Department of Mathematics, University of Bergen, Norway.

2021 (August – December): Real Analysis (10 credits) lectures for undergraduate students, Department of Mathematics, University of Bergen, Norway.

Member of the comities:

Evaluation of a PhD thesis for the defense:
2021: Stefano Piceghello, University of Bergen, Norway
2021: Eugenia Ferrari, University of Bergen, Norway
2021: Shirin Fallahi, University of Bergen, Norway
2019: Kristoffer Varholm, Norwegian Technological University (NTNU), Norway
2019: Mathieu Kohli, University Paris-Saclay, Ecole Polytechnique, France
2019: Eivind Schneider, Arctic University of Norway (UiT), Tromsø. Norway
2019: Mikhail Kuznetsov, Sobolev Institute of Mathematics, Novosibirsk, Russia
2017: Valentina Penso, University of Bologna, Italy
2014: Amina Mortada, Université Paris-Sud XI, CNRS, France
2013: Torleif Veen, University of Bergen, Bergen, Norway.
2013: Huiyan Xue, University of Bergen, Bergen, Norway.
2012: Petri Kokkonen, Ecole Polytechnique, France, and University of Eastern Finland, Finland
2010: Nguyet Thanh Nguyen, University of Bergen, Bergen, Norway.

Hiring comity on a PhD and/or postdoc position:
2021: PhD and 2 postdoc positions (MTS and NFR projects), University of Bergen, Norway
2021: Postdoc position, Arctic University of Norway, (UiT), Tromsø Norway.
2020: PhD and postdoc position (MTS project), University of Bergen, Norway
2020: Banking Foundation (FBLC) , "La Caixa" for the Postdoctoral Junior Leader Fellowships, a non-profit organization based in Barcelona, Spain,
2020: Postdoc position, Arctic University of Norway, (UiT), Tromsø Norway.
2018: PhD and postdoc position (BFS project), University of Bergen, Norway
2016: PhD position (mathematical department position), University of Bergen, Norway
2015: 2 PhD positions (mathematical/informatics department position), University of Bergen, Norway
2015: PhD position (ISP project), University of Bergen, Norway
2013: PhD position (topology group), University of Bergen, Norway

International scientific committee for the accreditation of PhD programs:
2021: Institute of Applied Mathematics and Mechanics, of the National Ukrainian Academy of Science, Slavyansk, Ukraine.
2021: Department of Mathematics, Zhytomyr Ivan Franko State University, Ukraine

External sensor for the examination of basic courses, bachelor, and master projects at Norwegian Universities:
Since 2012: University of Stavanger (UiS), Arctic University of Norway (UiT), Norwegian School of Economics (NHH), Western Norway University of Applied Science (Høgskulen på Vestlandet)

LIST OF PUBLICATIONS

I. Published papers

81. K. Hueper, I. Markina, F.Silva Leite. An extrinsic approach to sub-Riemannian geodesics On the orthogonal group. J. A. Goncalves et al. (Eds.): CONTROLO 2020, Proceedings of the 14-th APCA International Conference on Automatic Control and Soft Computing, LNEE **695**, pp. 274 -283, 2021.

80. M. Godoy Molino, I. Markina. Sub-Riemannian geodesics on nested principal bundles. J. A. Goncalves et al. (Eds.): CONTROLO 2020, Proceedings of the 14-th APCA International Conference on Automatic Control and Soft Computing, LNEE **695**, pp. 82-92, 2021.

79. K. Hueper, I. Markina, F.Silva Leite. A Lagrangian approach to extremal curves on Stiefel manifolds. J.Geom Mech. **13** (2021) no. 1, 55-72

78. K.Furutani, I.Markina. Automorphism groups of pseudo H-type algebras. J. Algebra, **568** (2021), 91-138.

77. W.Bauer, A. Froehly, I.Markina. Fundamental solutions of a class of ultra-hyperbolic operators on pseudo H-type groups. Adv. Math. **369** (2020) 107186, 46 pp.

76. V.Jurdjevic, I.Markina, F.Silva Leite Extremal curves on Stiefel and Grassmann manifolds, J. Geom. Anal. **30** (2020), no. 4, 3948-3978.

75. D. C. Chang, I.Markina, W. Wang. The Laguerre calculus on the nilpotent Lie groups of step two. J. Math. Analysis and Appl. **475** (2019), no.2, 1855-1882.

74. K.Furutani, I.Markina. Complete classification of H-type algebras II. Geom. Dedicata. **202** (2019), 233-264.

73. M.Godoy, E.Grong, I.Markina. Submersions and curves of constant geodesic curvature, Math. Nachr. **292** (2019), no. 9, 1956-1971

72. Markina, M. Rafaelli. Flat approximations of hypersurfaces along curves, Manuscripta Math., **160** (2019), no. 3-4, 315-325.

71. M.Godoy, K.Furutani, I.Markina, T.Morimoto, A. Vasiliev. Lie algebras attached to Clifford modules and simple graded Lie algebras, J. Lie Theory 28 (2018), no. 3, 843–864.

70. M.Godoy, B. Kruglikov, I. Markina. A. Vasiliev. Rigidity of 2-step Carnot groups. J. Geom. Anal. 28 (2018), no. 2, 14 77-1501.

69. C.Autenried, K.Furutani, I.Markina, A.Vasiliev. Pseudo-metric 2-step nilpotent Lie algebras, Adv. Geom. 18 (2018), no. 2, 237-263.

68.M.Brakalova, I.Markina, A.Vasiliev. Extremal functions for modulus of systems of measures. Journal d'Analyse Mathématique, 133 (1), (2017), 335-359.

67. I.Markina. Sub-Riemannian geometry and hypoelliptic operators.Analytic, algebraic and geometric aspects of differential equations, 89–198, Trends Math.,Birkhäuser/Springer, Cham, 2017.

66. K.Furutani, I.Markina. Complete classification of pseudo H-type algebras I, Geom. Dedicata **190** (1), 2017, 23-51.

65. I.Markina, F. Silva Leite. Introduction to the intrinsic rolling with indefinite metric. Communications Anal. Geom. **24** (2016), no 5, 1085-1106.

64. M.Brakalova, I.Markina, A. Vasiliev. Modules of systems of measures on polarizable Carnot groups, Arkiv fur Matematikk, **54** (2016), no. 2, 371-401.

63. D.C.Chang, I.Markina. W.Wang. On the Hodge-type decomposition and cohomolgy groups of k-Cauchy-Fueter complexes over domains in the quaternionic space. J. Geom. and Phys, **107** (2016), 15-34.

62. I. Markina. Geodesics in the geometry with constrains. "Quantization, PDEs, and geometry", 153–314, Oper. Theory Adv. Appl., 251, Birkhäuser/Springer, Cham, 2016.

61. I.Markina, A. Vasiliev. Evolution of smooth shapes and integrable systems. Comput. Methods Funct. Theory 16 (2016), no. 2, 203–229..

60. Y. Chitour, M. Godoy, P. Kokkonen, I. Markina. Rolling against a sphere: The non transitive case, J. Geom. Anal. **26** (2016), no. 4, p. 2542–2562.

59. K.Furutani, I.Markina, A. Vasiliev. Free nilpotent and H-type Lie algebras. Combinatorial and orthogonal designs. J. Pure and Appl. Algebra, **219** (2015), 5467-5492.

58. I.Markina, M. Salehani. Controllability on infinite dimensional manifolds. Acta. Appl. Math. 134 (2014), 229-246.

57. I.Markina, E. Grong. A. Vasiliev. Sub-Riemannian geometry of infinite dimensional manifolds. J. Geom. Anal. vol. **25**, no 4, 2474-2515.

56. I. Markina, S. Wojtowytsch. On the Alexandrov topology of sub-Lorentzian manifolds. Springer INDAM Series, 5 (2014) 287-312. arXiv: 1301.0635

55. I. Markina, K. Furutani. Existence of the lattice on general H-type groups. J. Lie Theory, **24**, (2014), 979-1011. arXiv: 1305.6814.

54. I. Markina, C. Autenried. Sub-Riemannian geometry of Stiefel manifolds. SIAM J. Control Optim., 52 (2) (2014) 939-959.

53. I.Markina, A. Vasiliev. Loewner-Kufarev evolution in the Segal-Wilson grassmannian. I. Geometric methods in physics. Springer Science - Business media B.V. 2013, s 367-377.

52. I.Markina, M. Godoy. A.Korolko. Sub-semi-Riemannian geometry of general H-type groups. Bull. Sci. Math. 137 (2013), no. 6, 805-833.

51. I.Markina. D.C.Chang, W.Wang. On Cauchy-Szegeo kernel for quaternionic Siegel upper half space. Complex Anal. Oper. Theory, 7, (2013), no. 5, 1623-1654.

50. I.Markina, E. Grong. A. Vasiliev. Sub-Riemannian structures corresponding to Kaelerian metrics on the Universal Teichmueller space and curve. Proceeding of the Conference "60 years Analytic Functions in Lublin" in memory of Jan G. Krzyz., 2012, 98 – 115. arXiv 1202.6135

49. I.Markina, A. Vasiliev. Löwner-Kufarev evolution in the Segal-Wilson Grassmannian. Geometric Methods in Physics, XXX Workshop 2011, Trends in Mathematics, 367 -- 376 2012 Springer Basel AG.

48. M.Godoy, I.Markina, Sub-Riemannian geodesics and heat operator on odd dimensional spheres. Anal Math. Phys. 2 (2012) no. 2, 123—147.

47. M.Godoy, E.Grong, F.Silva Leite, I.Markina. An intrinsic formulation of the rolling manifolds problem. *Journal of Dynamical and Control Systems.* 18 (2012), no. 2. 181--214

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Teaching philosophy statement

Introduction

Teaching is an opportunity for myself to learn and grow in addition to fulfilling the obligation of educating students. I have 32 years of teaching experience in Russia, Chile, and Norway where I taught in Russian, Spanish, English, and Norwegian. I have had good luck to teach in a special college oriented and directed by the Novosibirsk State University, one of the most important educational institutions in the former Soviet Union. Then, I worked at the Mathematics and Physics Department of the same University and at the Novosibirsk University of Telecommunication. I worked as a visiting professor at the Technical University Federico Santa Maria in Valparaiso (Chile) where I gave classes both at the undergraduate and graduate level. Normally, I was responsible for teaching four-five courses during the academic year at Chile. I taught courses at the undergraduate and graduate level being also responsible for the scientific seminar of the analysis group at the Mathematical Department of the University of Bergen. I have finished the pedagogical courses organized by the Pedagogical Department of the University of Bergen with 20 credits.

I believe there are two aspects in teaching, which are of equal importance. The first one is to transfer knowledge to the next generation such that the knowledge is continued. This is basic and this requires me as a teacher to have sound command of the subject and presents it in the best possible manner. The second aspect of equal if not surpass importance is to inspire the students to learn for themselves. It is my goal that at the end of the first year, my students will begin to change their established learning attitude and see learning as a transforming and interesting process. I want to help students succeed in life and think that we can all learn and have fun at the same time. Working during the five years at a technological university, I desire to see my students understand not only the basic concepts of the subject, but to go further to be able to apply their knowledge to tackle real world engineering problems.

In short, I enjoy teaching. My considerable experience teaching many levels of undergraduate and graduate students across a broad assortment of course topics has been very rewarding. I've made a lot of mistakes, particularly early in my training. I believe I have learned from those errors and improved greatly. For me, science is a way of viewing the world and a context within which I approach discovery. Fueled by curiosity, tempered by logic and healthy skepticism, and rewarded with discovery, I believe that mathematics students will enjoy the subjects I teach and to which I have dedicated part of my life. I have many contacts with my former students who work now in industry as well as in academy.

Teaching philosophy and methods

Teaching in classroom. Student needs. In my opinion, an excellent lecture is not just a well-prepared and clear presentation of good quality teaching materials, but also involves: active responses of student in terms of good understanding of the subject knowledge, and inspiration of student interest and creative thinking, lecturer's enthusiasm and student's concentration, good learning atmosphere with the appropriate classroom discipline.

Student's needs vary from person to person, and from one stage to another stage in their learning process. To understand the needs of a student is by itself a continuing learning process of the lecturer to interact with the student, pay attention to his/her, and be able to observe and obtain feedback of student progress in order to understand his/her learning difficulties. To help resolve these difficulties encountered, I have tried to allocate extra consultation hours for each group of

students to help those in need. I find that this is effective for both the bright and slow learners as I can deal with each of their problems separately, and offer the appropriate help to satisfy their individual needs.

Motivation. It is impossible to teach students something they do not want to learn. Since many students from other departments take a math. course simply to fulfill a requirement, extra effort must be made to gain and keep their interest. It is important to foster a positive experience and individual involvement. I attempt to motivate my students by: (1) making adjustments in the material of the class to suit the students in front of me, (2) making the material relevant to their lives, (3) dividing each class period into several, short duration activities which require active participation by all, (4) having and encouraging a sense of humor, and (5) bringing in "realia", that is, authentic examples from physics and mechanics use to relate to each other.

Small group teaching. Lectures delivered by means of large group teaching are cost effective and efficient for the learning of basic concepts and methods of techniques. Usually, this arrangement does not provide many opportunities for problem solving to handle individual difficulties and exchanging ideas. To enhance student learning and communication skills, it should therefore be necessary to supplement the large group teaching with tutorials for group discussion and problem solving based on a small group teaching. In this way, it is easier to stimulate student involvement, encourage their participation and to deal with their concern in small group teaching activities. In the teaching of graduate courses, I find that small group approach is particularly important to enhance student learning and to improve their problem solving and communication skills.

Dissertations. I always encourage my students to act as teachers themselves. I often give some part of topic that we study at the moment as a dissertation. This method is especially welcomed for graduate students to prepare them for their future work as tutors. During the semester every student has a possibility to prepare a theme that is most attractive for him/her.

Uses of technology. I try to use computers when it is possible for demonstration purposes in several courses. Some of the Universities, where I taught, had a special computer laboratory classes as a support of many courses, especially Calculus and Differential Equations. Mostly, the software in use is Mathematica, MathLab, Mapple. Nevertheless, the use of computers is also possible for more advanced courses. Some of the homework assignments for undergraduate courses are designed to be solved with the help of a calculator. I never accept a mathematical result made only by a calculator (integration, series, differential equation), but I always encourage students to check their result by calculator/computer if possible. All courses make use of the World Wide Web for informational purposes and some distribution of class materials.

Evaluation. Evaluation of students will occur in a variety of ways. Students will be observed on group activities, preparational handouts, question asking, and tests. If I see that students are performing poorly in one area then that will be the area we spend more time on. By evaluating students, I will be able to observe how each student learns best. The younger students are, the harder it will be for me to keep their attention. So, it is my responsibility to be prepared and flexible with new back-up plans. If a project that I have assigned is not grasping the students' attention then I need to move on to better alternatives that will help them be more involved their work.

New courses and teaching improvement. I have been frequently asked to take up the teaching of newly introduced modules or modules with difficult topics, especially at the graduate level. I accepted all these challenges and worked hard to get myself well prepared for these teaching responsibilities. The way I teach is the result of 8 years of study and coursework at the Novosibirsk State University and 20 years of teaching, influential mentors, talking with my colleagues. I had many excellent professors and colleagues as good role models and only suffered with a few poor ones. This year we work hard to improve courses syllabi as well as intercourses links. Especially, I am working with colleagues on the package of "continue mathematics": analysis, functional and complex analysis, differential equations. I plan to use the World Wide Web to provide more information and communication, with class handouts available in Postscript and PDF formats, more use of visual materials: slides and computer demonstrations (for example making use of Prosper program). More short quizzes are planned to be included in lower level classes. I strongly encourage my students to participate in mathematical activities of our department and in conferences organized by the university and mathematical society. This implies that I will be helping for students to look for financial support.

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