Seminář se koná v učebně M5 (a/nebo online) Ústavu matematiky a statistiky, budova 08, areál Přírodovědecké fakulty, Kotlářská 2, Brno, vždy v 10:00.

Vedoucí semináře:

- Prof. RNDr. Jan Slovák, DrSc.,
- Prof. RNDr. Josef Janyška, DSc.,
- Doc. Josef Šilhan, PhD. (programový vedoucí),

Přednášky v podzimním semestru 2022

- 3. 10. 2022 (start at 10:00, lecture room M5 and MSTeams)
  Sam Blitz
  Introduction to Conformal Hypersurface Geometry

  Abstract:
  Hypersurfaces embedded in conformal manifolds appear naturally in string theory, and their geometry is an invaluable tool for studying interesting problems in differential geometry. While Weyl's classical invariant theory makes easy work of diffeomorphism invariants in Riemannian geometry, it is less obvious how to restrict these invariants to only those that respect an underlying conformal structure. This remains the case when studying embedded hypersurfaces. We are thus faced with the problem of how one might generate such invariants; in doing so, we are led to tractors, an invaluable tool for studying conformal geometry, amongst other things. By analogizing to the Riemannian setting, we can develop a hypersurface tractor calculus, enabling us to generate a (perhaps incomplete) set of conformal hypersurface invariants.

Přednášky v jarním semestru 2022

- 9. 5. 2022 (start at 10:00, lecture room M5 and MSTeams)
  Josef Šilhan
  Modified Patterson-Walker construction

  Abstract:
  The classical Patterson-Walker (spit signature) metric is defined on the cotangent bundle of an affine manifold. A slight generalisation leads to a projective-to conformal version of this construction. There are several ways how to modify this construction and we shall discuss certain class of these modifications in details. In particular, we shall identify conformal symmetries 'upstairs' in terms of suitable projective data 'downstairs'. We shall also discuss almost Einstein scales in a similar way. (This is a joint work with M. Hammerl, K. Sagerschnig a V. Žádník.)

- 3. 5. 2022 (start at 10:00, lecture room M3 and MSTeams)
  Gerd Schmalz
  CR manifolds with symmetries and the embeddabilty problem

  Abstract:
  It is a classical result by Jacobowitz that a hypersurface type CR manifold M with complex structure V can be locally realised as a hypersurface in complex space if and only if there exists a complex vector field Z transversal to V and such that $[Z,V]subseteq V$. Hill and Nacinovich proved the following generalisation: If (M,V) is a CR manifold of type (n,k) and there exists a solvable Lie algebra of complex vector fields of dimension $ellle k$ transversal to V then (M,V) can be embedded into a CR manifold $(M'V')$ of type $(n+ell, k-ell)$. In particular, if $k=ell$ this is an embedding into complex space. I will present a generalisation for Hill and Nacinovich's theorem without the assumption of solvability of the Lie algebra. This is joint work with M. Cowling and A.Ottazzi (UNSW) and Masoud Ganji (UNE).

- 14. 2. 2022
  Ondřej Hulík
  Generalized and Exceptional geometry and its relation to supergravity and M theory

Přednášky v podzimním semestru 2021

- 29. 11. 2021
  Mauro Mantegazza
  Towards a non-commutative generalization of the jet functor

- 22. 11. 2021
  Giovanni Russo
  Nearly Kahler six-manifolds with two-torus symmetry

- 25. 10. 2021
  David Sykes
  On geometry of 2-nondegenrate, hypersurface-type Cauchy-Rieman structures encoded by dynamical Legendrian contact structures

- 11. 10. 2021
  Henrik Winther
  Differential geometry of $SO*(2n)$-structures and $SO*(2n)Sp(1)$-structures

Přednášky v podzimním semestru 2017

- 13. 11. 2017
  Radoslaw Kycia
  Topological modelling of nuclear pasta phases

- 6. 11. 2017
  Jan Slovák
  Cartan-Kähler theory -- application to quaternionic contact structures

- 30. 10. 2017

Josef Šilhan
Interesting connections in the projective class, and obstructions

Přednášky v jarním semestru 2017

- 22. 5. 2017
  Henrik Winther
  Non-degenerate Almost- and Para-Complex structures, and their Symmetries

- 24. 4. 2017
  Sumit Kaushik
  Curve Evolution under Extrinsic metrics for DTI processing

- 10. 4. 2017
  Jan Gregorovič
  On standard models of CR and para--CR manifolds

- 20. 3. 2017
  Vojtěch Žádník
  The curves, or from Frenet apparatus to Thomas tractors and back again

- 6. 3. 2017
  Jan Slovák:
  Constant curvature models in sub-Riemannian geometry

Přednášky v podzimním semestru 2016

- 12. 12. 2016
  Josef Šilhan
  Curves in conformal and projective geometries

- 21. 11., 2016, the lecture room M5:
  10.00
  Miroslav Kureš
  TBA

- 14. 11. 2016, the lecture room M5:
  10.00
  Phan Thanh Nam
  Recent progress on the ionization problem

- 31. 10. 2016
  10.00 - 10.50
  Ivan Minchev
  On the generality of quaternionic contact structures

  11.00 - 11.50
  Gerd Schmalz
  Chern-Moser theory for para-CR-manifolds and degenerate multi-contact structures

- 24. 10. 2016
  Ilya Kossovskiy
  The Associated Differential Equations Method in CR-geometry

- 10. 10. 2016
  Arman Taghavi-Chabert

Přednášky v jarním semestru 2016

- 13. 6. 2016
  Stefan Ivanov
  The quaternionic contact Yamabe problem

- 9. 5. 2016
  Josef Šilhan
  Higher supersymmetries

- 25. 4. 2016
  Diana Barseghyan (University of Ostrava)
  Spectral analysis of a class of Schroedinger operators exhibiting a parameter-dependent spectral transition

- 11. 4. 2016
  Anton Galaev
  Special Kähler-Lorentz metrics

- 14. 3. 2016
  Jan Slovák

- 7. 3. 2016
  Vladimir Ezhov (Flinders University/ MPIM Bonn)
  New familiy of unbounded homogeneous tube domains in Cn

- 29. 2. 2016
  Ioannis Chrysikos

Spin and metaplectic structures on homogeneous spaces

-

22. 2. 2016
Matthias Hammerl (University of Greifswald):
Holography of BGG-Solutions

Přednášky v podzimním semestru 2015

- 7. 12. 2015
  Katja Sagerschnik
  Nurowski's conformal structures with almost Einstein scales

- 30. 11. 2015
  Matthew Randall

- 23. 11. 2015
  Vojtěch Žádník

Report on Lie contact structures

- 2.11.2015
  Gueo Grantcharov (the Florida International University, USA):
  On HKT geometry

- 26.10.2015
  Matthew Burke
  Synthetic Lie Theory Part I: An Introduction to Synthetic Differential Geometry

Parts II and III will be presented on the seminar on algebra on October 29 and Novenber 5 (1pm, seminar room)

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12.5.2015
Anton Galaev
Holonomy algebras of Einstein pseudo-Riemannian manifolds

Přednášky v jarním semestru 2015

- 18.5.2015
  Yaroslav Bazaykin
  Numerical analysis of topological characteristics of three-dimensional geological models of oil and gas fields

Zoran Škoda
Hopf algebroids of differential operators

- 11.5.2015
  Ioannis Chrysikos
  Killing spinors with torsion and applications

- 27. 4. 2015
  Zdeněk Dušek
  How many are affine connections of special types

- 20. 4. 2015
  Michal Marvan
  Integrable surfaces II

- 13. 4. 2015
  Arman Taghavi-Chabert:
  Twistorial description of null foliations

-

30.3.2015
Dmitri Alekseevsky
Conformally homogeneous manifolds

- 2. 3. 2015
  Anton Galaev
  Classification of third-order symmetric Lorentzian manifolds

- 9. 3. 2015
  Jan Slovák
  Linearized metrizability problem for Parabolic Geometries
  -- general procedure and examples

Přednášky v podzimním semestru 2014

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15.12. 2014
Christian Gustad
Regular and singular contact actions of Lie algebras

- 8. 12. 2014
Ioannis Chrysikos
Killing and twistor spinors with torsion on compact naturally reductive spaces

- 1. 12. 2014
Jean-Philippe Michel
Dirac operators and their symbols

- 10. 11. 2014
Georgy Sharygin
Local formulas for characteristic classes

- 3. 11. 2014
Dmitri Alekseevski
Homogeneous pseudo-Riemannian Einstein metrics associated with graded semisimple Lie algebras

- 13. 10. 2014
Ivan Kolář

On the vertical Weil bundles

- 6. 10. 2014
  Anton Galaev
  How to compute the holonomy algebra of a Lorentzian manifold

- 24. 9. 2014
  Stefan Ivanov
  The Lichnerowicz-Obata sphere theorems on a quaternionic contact manifold of dimension bigger than seven"

- 22. 9. 2014
  Dimiter Vassilev
  Lichnerowicz-Obata sub-laplacian eigenvalue theorem in CR geometry under a positive "Ricci" bound

Přednášky v jarním semestru 2014

- 12. 5. 2014
  Dimiter Vassilev
  Quaternionic contact Liouville theorem and applications

- 5. 5. 2014
  Ivan Kolář
  On general connections

- 14. 4 .2013

Dmitri Alekseevski

- 7. 4. 2014
  Yaroslav Bazaykin
  Stability of integral persistence diagrams
-

- 24. 3. 2014 ,12:00--13:50, lecture room M4
  25. 3. 2014, 10:00--11:50, lecture room MS1
  27. 3. 2014, 10:00--11:50, lecture room M4
  31. 3. 2014, 12:00--13:50, lecture room M4
  Evgeny Malkovich
  Construction of metrics with special holonomies via geometrical flows
  (series of lectures)

- 10. 3. 2014
  Katja Sagerschnig
  Conformal structures in dimension four and generic rank two distributions in dimension five

- 3. 3. 2014
  Anton Galaev
  Irreducible holonomy algebras of Riemannian supermanifolds

Přednášky v podzimním semestru 2013

- 25. 11. 2013
  Jonathan Kress
  Recent progress in superintegrable systems

- 18.11. 2013
  Ivan Minchev
  Quaternionic contact hypersurfaces in hyper-Kaehler geometry

- 11. 11. 2013
  Anton Galaev
  Holonomy groups of superconnections on supermanifolds

- 4. 11. 2013
  Giovanni Moreno
  Meta-symplectic geometry of 3rd order Monge-Ampére equations

- 21. 10. 2013
  Jan Gregorovič
  Generalized symmetries of homogeneous parabolic geometries

- 7. 10. 2013
  Ivan Kolář
  General connections and the Froehlicher-Nijenhuis bracket

- 30. 9. 2013
  Dmitri Alekseevsky
  Classification of cohomogeneikty one Kaehler G-manifoldsÂÂÂÂÂÂÂÂ of a compact semisimple groupÂÂÂÂÂÂÂÂ G in terms of painted Dynkin diagrams

Přednášky v jarním semestru 2013

- 13. 5. 2013

John Ryan
Dirac type operators and conformal groups

- 15. 4. 2013
  Christian Gustad

- 8. 4. 2013
  Anton Galaev
  Pseudo-Riemannian manifolds with recurrent spinor fields

- 25. 3. 2013
  Josef Šilhan
  On symmetries of the Laplacian

- 18. 3. 2013
  Ivan Kolář
  On natural transformations of Weil bundles

- 4. 3. 2013
  Rikard von Unge
  Generalized Kahler reduction

- 25. 2. 2013
  Joseph Krasiľshchik
  On geometry of integrable systems and its cohomological background

Přednášky v podzimním semestru 2012

- 10. 12. 2012
  Jan Slovák
  Conformal Fedosov manifolds

- 26. 11. 2012
  Dmitri Alekseevsky
  TBA

- 19. 11. 2012
  Ivan Kolář
  On the functorial prolongations of fiber bundles

- 12. 11. 2012
  Ioannis Chrysikos
  The Dirac operator on non-naturally reductive spaces

- 29. 10. 2012
  Andrea Santi
  On the automorphism group of extended Poincaré structures

- 15. 10. 2012
  Anton Galaev
  Algorithm for deRham-Wu decomposition for Riemannian and Lorentzian manifolds

- 1. 10. 2012
  Jan Gregorovič
  Geometric structures invariant to symmetries