WORKSHOP ON ALMOST HERMITIAN AND CONTACT GEOMETRY

CASTLE BĘDLEWO, OCTOBER 18 – 24, 2015

Organizers: Ilka Agricola (Philipps-Universität Marburg)
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Workshop on almost hermitian and contact geometry

Castle Będlewo, October 18 – 24, 2015

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Monday, October 19

09:00 – 09:50	Hansjörg Geiges Transversely holomorphic flows on 3-manifolds
	– coffee break –
10:30 – 11:20	Gil Cavalcanti Stable generalized complex structure
11:30 – 12:10	Antonio de Nicola Hard lefschetz theorem for Vaisman manifolds
	– lunch break –
14:30 – 15:20	María Laura Barberis Conformal Killing 2-forms on low dimensional Lie groups
	– coffee break –
16:00 – 16:30	Henrik Winther Strictly nearly pseudo-Kähler manifolds with large symmetry groups
16:40 – 17:10	Yuri Nikolayevsky Locally conformally Berwald manifolds and compact quotients of reducible Riemannian manifolds by homotheties
17:20 – 18:00	Poster session

Tuesday, October 20

09:00 – 09:50 Andrew Dancer
Symplectic and Hyperkähler implosion

– coffee break –

10:30 – 11:20 Marisa Fernández
On Formality of Cosymplectic and Sasakian Manifolds

11:30 – 12:10 Lars Schäfer
Six-dimensional bi-Lagrangian nilmanifolds

– lunch break –

14:30 – 15:20 Iskander Taimanov
On a high-dimensional generalization of Seifert fibrations

– coffee break –

	Session A	Session B
16:00 – 16:30	A. Otiman Locally conformally symplectic forms	Z. Dusek How many are affine connections of special types
16:40 – 17:10	M. Origlia Locally conformally symplectic str. on nilpotent or almost abelian Lie groups	S. Szancer Affine hypersurfaces with an induced almost paracontact metric structure
17:20 – 17:50	A. Borówka Generalized Feix-Kaledin construction of quaternionic manifolds	A. Najberg Gradient and divergence on symplectic manifolds

Wednesday, October 21

09:00 – 09:50 Adriano Tomassini
On the cohomology of complex manifolds

– coffee break –

10:30 – 11:20 Yurii G. Nikonorov
On Killing vector fields of constant length on homogeneous Riemannian manifolds

11:30 – 12:10 Homare Tadano
Galloway type theorem for complete Sasaki manifolds

– lunch break & free afternoon –

Thursday, October 22

09:00 – 09:50 Christina Tønnesen-Friedman
Existence of Constant Scalar Curvature Sasaki Structures on Sasaki Join Manifold

– coffee break –

10:30 – 11:20 Robert Wolak
Sasakian structures and their generalizations. Foliated approach

11:30 – 12:10 Ioannis Chrysikos
Killing spinors with torsion parallel under the characteristic connection

– lunch break –

	Session A	Session B
14:30 – 15:10	S. Krýsl Dirac operators in symplectic and contact geometry – the problem of infinite dimension	R. O'Buachalla The Noncomm. Kähler Geometry of the Quantum Grassmannians and q-Deformed Schubert Calculus
	– coffee break –	
15:50 – 16:30	P. Weber Seiberg-Witten invariants as a tool to distinguish contact structures on diffeomorphic 5-manifolds	H. Kamada Quaternionic CR structure: a geom. structure modeled on a real hypersurface in a quatern. manifold
16:40 – 17:20	V. Balashchenko Canonical structures on generalized symmetric spaces	W. Jelonek Kähler surfaces with quasi-constant holomorphic curvature

Friday, October 23

09:00 – 09:50 Indranil Biswas
Deligne pairing and Quillen metric

– coffee break –

10:30 – 11:20 Boris Kruglikov
C-projective structures in situations with large symmetry algebras

11:30 – 12:10 Giovanni Bazzoni
K-cosymplectic structures

– lunch break –

14:30 – 15:10 Nikon Kurnosov
Betti numbers of hyperkähler manifolds

15:10 – 15:50 Bogusław Hajduk
Explicit Morse inequalities for manifolds with boundary: the case of m-functions

– coffee break & end of workshop –

Abstracts

Biswas, Indranil – Deligne pairing and Quillen metric. Let $X \longrightarrow S$ be a smooth projective surjective morphism of relative dimension n, where X and S are integral schemes over $\mathbb{C}$. Let $L \longrightarrow X$ be a relatively very ample line bundle. For every sufficiently large positive integer m, there is a canonical isomorphism of the Deligne pairing $\langle L\,,\cdots,L\rangle \longrightarrow S$ with the determinant line bundle $\text{Det}((L-\mathcal{O}_X)^{\otimes(n+1)}\otimes L^{\otimes m})$. If we fix a hermitian structure on L and a relative Kähler form on X, then each of the line bundles $\text{Det}((L-\mathcal{O}_X)^{\otimes(n+1)}\otimes L^{\otimes m})$ and $\langle L\,,\cdots,L\rangle$ carries a distinguished hermitian structure. We prove that the above mentioned isomorphism between $\langle L\,,\cdots,L\rangle \longrightarrow S$ and $\text{Det}((L-\mathcal{O}_X)^{\otimes(n+1)}\otimes L^{\otimes m})$ is compatible with these hermitian structures. This holds also for the isomorphism between a Deligne paring and a certain determinant line bundle. (joint work with Georg Schumacher, Marburg)

Cavalcanti, Gil – Stable generalized complex structure. Stable generalized complex structures are a special class of generalized complex manifolds which are not too far from being symplectic. We show that the stable condition can be rephrased by saying that the structure is equivalent to a symplectic structure on a Lie algebroid. This equivalence allows us to show that deformations of these structures are unobstructed and we obtain a local normal form for the set of points where the structure fails to be symplectic. Some topological restrictions to the existence of such structures follow from the normal form.

Dancer, Andrew – Symplectic and Hyperkähler implosion. We review implosion constructions in symplectic and hyperkähler geometry, emphasising the links with non-reductive geometric invariant theory. We also describe some recent work on aproaching hyperkähler implosion via moduli spaces of solutions to Nahm's equations.

Fernández, Marisa – On Formality of Cosymplectic and Sasakian Manifolds. One of the results of Deligne, Griffiths, Morgan and Sullivan states that any compact Kähler manifold is formal. In this talk, we study the formality, and more precisely Massey products, for the odd-dimensional counterpart to Kähler and symplectic manifolds, namely for cokähler, Sasakian and cosymplectic manifolds. As an application we show examples of simply connected K-contact manifolds not admitting Sasakian structures. This is joint work with G. Bazzoni, I. Biswas, V. Muñoz and A. Tralle.

Geiges, Hansjörg – Transversely holomorphic flows on 3-manifolds. In this talk, based on joint work with Jesús Gonzalo Pérez, I shall discuss a Godbillon–Vey invariant for transversely holomorphic foliations on 3-manifolds, which leads to a generalised Gauß–Bonnet theorem. I shall also describe some topological aspects of transversely holomorphic foliations on the 3-sphere, including applications to the classification of taut contact circles.

Tomassini, Adriano – On the cohomology of complex manifolds. Recently, some authors have been studying cohomological properties of compact complex and almost-complex manifolds. In this talk, we will speak about some recent results on Dolbeault, Bott-Chern and Aeppli cohomologies of complex non-Kähler manifolds. We also would like to discuss the almost-Kähler case.

Tønnesen-Friedman, Christina – Existence of Constant Scalar Curvature Sasaki Structures on Sasaki Join Manifold. In this talk, which is based on joint work with Charles Boyer, Hongnian Huang, and Eveline Legendre, we look at the existence of constant scalar curvature Sasaki structures (cscS). We show that the Einstein–Hilbert functional detects the vanishing Sasaki-Futaki invariant. In particular, this provides an obstruction to the existence of a constant scalar curvature Sasakian metric. For certain so-called Sasaki join manifolds, we then apply this result to provide an explicit, computable, necessary, and sufficient condition for the existence of cscS within a certain sub cone of the Sasaki cone.

Wolak, Robert – Sasakian structures and their generalizations. Foliated approach. A Sasaki structure can be understood as Riemannian flow (foliation) whose transverse structure is not only Riemannian but Kählerian. This condition is of course not sufficient, there are numerous Riemannian flows which are transversely Kählerian but not Sasakian. This additional necessary assumption can be formulated in many ways. This point of view permits to distinguish two types of geometrical properties of these manifolds, those which are foliated and related to the transverse Kähler structure, those which are shared by all transversely Kähler foliations, and those which are intrinsically Sasakian. We will show that many properties of Sasakian manifolds are in fact foliated/transverse properties and can be relatively easily proved from those of Kähler manifolds. We will point out these properties which are truly Sasakian. Finally, we develop a similar approach for tranversely Kähler foliation defined by locally free actions of higher dimensional Lie groups.

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Balashchenko, Vitaly – Canonical structures on generalized symmetric spaces. The main goal of the talk is to present basic facts in the theory of canonical structures on generalized symmetric spaces as well as their applications to generalized Hermitian geometry and homogeneous Riemannian geometry. We dwell on the following items:

(1) Canonical structures on regular Φ-spaces
(2) Applications to generalized Hermitian geometry
(3) Applications to homogeneous Riemannian geometry
(4) Left-invariant structures on nilpotent Lie groups
(5) Canonical structures of "metallic family"
(6) Nearly Kähler f-structures on Riemannian regular Φ-spaces (the most general case).

Barberis, María Laura – Conformal Killing 2-forms on low dimensional Lie groups. Conformal Killing forms were introduced a few decades ago in the physics literature as a way to construct first integrals of the equation of motion. Conformal Killing forms generalize to higher degrees the notion of conformal vector fields, and can be characterized by the fact that their covariant derivative with respect to the Levi-Civita connection is completely determined by their exterior derivative and divergence. Such forms have been applied to define symmetries of field equations.

We consider left invariant conformal Killing 2-forms on Lie groups with a left invariant metric. We present some results for 2-step nilpotent Lie groups and for compact Lie groups with a bi-invariant metric. In dimension 3, we obtain the classification of the Lie groups and the left invariant metrics admitting conformal Killing-Yano 2-forms. In the 4-dimensional case, we obtain some general results for Riemanniana manifolds and we consider conformal Killing 2-forms (not necessarily left invariant) on 4-dimensional Lie groups. We describe all metric Lie algebras of dimension 4 whose associated simply connected Lie groups G endowed with the corresponding left-invariant Riemannian metric carry non-trivial conformal Killing 2-forms.

Bazzoni, Giovanni – K-cosymplectic structures. Almost contact metric structures are strictly related to almost Her- mitian structures. In this talk I will consider K-cosymplectic structures, namely cosymplectic almost contact metric structures for which the Reeb field is Killing. In the compact case, I will describe some results on the structure and the cohomological properties of K-cosymplectic manifolds. I will also describe a class of deformations of almost contact metric structures, previously described by Takahashi and Tanno in the contact metric case. This is joint work with O. Goertsches, Munich.

Borówka, Aleksandra – Generalized Feix-Kaledin construction of quaternionic manifolds. The first non-trivial example of hyperkähler manifold is the Calabi metric on $T^*\mathbb{CP}^n$. This motivates the question of existence of hyperkähler metrics on the cotangent bundles of Kähler manifolds, for which positive local answer was provided independently by B. Feix and D. Kaledin. They showed that there exists a hyperkähler metric on a neighbourhood of the zero section of the cotangent bundle of a real analytic Kähler manifold. Moreover, they generalized this construction for hypercomplex manifolds, where the hypercomplex structure is constructed on the neighbourhood of the zero section of the tangent bundle of a complex manifold with a real analytic connection with curvature of type $(1,1)$.

In this talk we will discuss further generalization of this construction. Using twistor methods, starting from a $2n$-manifold M equipped with a c-projective structure with c-projective curvature of type $(1,1)$ and a line bundle L with a connection with curvature of type $(1,1)$, we will construct a quaternionic structure on a neighbourhood of the zero section of $TM \otimes \mathcal{L}$, where $\mathcal{L}$ is some unitary line bundle obtained from L. We will also discuss an example, where using the construction we obtain $Gr_2(\mathbb{C}^{n+2})$ which is an example of quaternion-Kähler manifold not, even locally, hyperkähler. The presented results are the joint work with D. Calderbank.

O'Buachalla, Réamonn – The Noncommutative Kähler Geometry of the Quantum Grassmannians and q-Deformed Schubert Calculus. Building on the definition of a noncommutative complex structure for a general algebra A, we introduce the notion of a *noncommutative Kähler structure* for A. In the special case where A is the coordinate algebra of a quantum homogeneous space, we show that many of the fundamental results of classical Kähler geometry follow from the existence of such a structure: Hodge decomposition, Serre duality, the Hard Lefschetz theorem, the Kähler identities, and collapse of the Frölicher spectral sequence at the first page. We then apply these results to Heckenberger and Kolb's differential calculus for the quantum Grassmannians, and show that they have cohomology groups of at least classical dimension. Finally, we discuss some initial results on how the classical rules of Schubert calculus behave under q-deformation.

Chrysikos, Ioannis – Killing spinors with torsion parallel under the characteristic connection. Given a compact Riemannian spin manifold endowed with a non-integrable G-structure, we study spinor fields which are parallel with respect to the characteristic connection. We show that the existence of a ∇^c-parallel spinor which satisfies the Killing spinor equation with torsion for some $s \neq 1/4$ with respect to the family $\nabla^s = \nabla^g + 2sT$, implies that (M^n, g) is both Einstein and ∇^c-Einstein. In particular, for ∇^c-parallel spinors and working always with respect to the same Riemannian metric, we provide a correspondence between the twistor equation with torsion, the Killing spinor equation with torsion and the Riemannian Killing spinor equation. This allows us to describe 1-parameter families of non-trivial Killing spinors with torsion (or twistor spinors with torsion) on nearly Kähler manifolds and nearly parallel G_2-manifolds, in dimensions 6 and 7 respectively.

De Nicola, Antonio – Hard lefschetz theorem for Vaisman manifolds. It is well known that in any compact Kähler manifold the exterior multiplication by a suitable power of the symplectic form induces isomorphisms between the de Rham cohomology spaces in complementary degrees. This is the celebrated Hard Lefschetz Theorem. In my talk I will present a version of the hard Lefschetz theorem for compact locally conformal Kähler manifolds with parallel Lee vector field, known as Vaisman manifolds. Our result is based on the hard Lefschetz theorem for Sasakian manifolds and the fact that any compact Vaisman manifold is the mapping torus of a compact Sasakian manifold.

Dusek, Zdenek – How many are affine connections of special types. In the present work, we describe locally the classes of special real analytic affine connections on the n-dimensional manifold in terms of arbitrary functions of n variables. We are interested in general affine connections

with arbitrary torsion, or, respectively, with zero torsion and for each of these cases the connections with symmetric, or, respectively, skew-symmetric Ricci tensor. Alternatively, we investigate equiaffine connections in each case. The essential tool is the Cauchy-Kowalevski Theorem for solving the sytem of PDEs. As a final result, we state that the numbers of functions characterizing some of the above respective classes are asymptotically equal at the infinity. This is joint work with Oldrich Kowalski, Prague.

Hajduk, Bogusław – Explicit Morse inequalities for manifolds with boundary: the case of m-functions. Morse inequalities give the lower bound for number of critical points of Morse functions on a smooth manifold. In the case of a manifold M with boundary, the Morse function is assumed to be constant in any component of the boundary. Then, if we assume that $\partial M = A \cup B$, the function is minimal on $A \subset \partial M$ and maximal on B, then the bound is expressed explicitly in terms of $H_*(M, A)$. A similar question is interesting for m-functions, i.ė., for functions having non-degenerate critical points and such that its restriction to the boundary is Morse. In this case the required inequality give the bound for the sum of the numbers of critical points of f and $f|\partial M$. The case of m-functions was considered by Kronheimer and Mrowka in their book on monopole theory and this raised interest in this subject. However, investigations of m-functions was initiated years ago by Jankowski, Rubinsztein, and Braess. In the present talk I will explain the structure of the chain model of an m-function and, building on that, I give an explicit lower bounds for the number of critical points. The main fact is that the inequalities depend on the homomorphisms induced by the inclusion $\partial M \to M$ in homology and cohomology together with a homology operation introduced in previous work.

Jelonek, Włodzimierz – Kähler surfaces with quasi-constant holomorphic curvature. In my talk I describe the class of QCH Kähler surfaces (surfaces with quasi-constant holomorphic curvature). We prove that this class of Kähler surfaces coincides with the class of Kähler surfaces admitting a negative almost Hermitian structure satisfying the Gray G2 condition and give a large class of examples. We also give a description of Kähler surfaces which admit an opposite almost Hermitian structure satisfying the Gray condition G1 and prove that such surfaces are semi-symmetric. We classify such surfaces for which the opposite almost Hermitian structure is Hermitian and conformally Kähler.

Kamada, Hiroyuki – Quaternionic CR structure: a geometric structure modeled on a real hypersurface in a quaternionic manifold. Modeled on a real hypersurface in a quaternionic manifold, we introduced a quaternionic analogue of CR structure, called quaternionic CR structure, together with the notion of its strong pseudoconvexity, as well as that of quaternionic pseudohermitian structure. We also constructed a canonical connection, an analogue of the Tanaka-Webster connection in complex CR geometry, associated with a quaternionic pseudohermitian structure, under a stronger convexity, which we call the ultra-pseudoconvexity. In my talk, I will introduce our recent work on quaternionic CR structure with examples and a comparison to Biquard's quaternionic contact structure. This is a joint work with Shin Nayatani.

Kurnosov, Nikon – Betti numbers of hyperkähler manifolds. In this talk I will introduce known results on the Beauville conjecture. In particular, I will explain boundary conditions for the second Betti number which follow from Rozansky-Witten invariants and $SO(4, b_2 - 2)$-action on cohomology. Guan has proved that in dimension four there can exist only finite numbers of hyperkähler manifolds. In dimension six and more some results are obtained by Sawon and Kurnosov.

Krýsl, Svatopluk – Dirac operators in symplectic and contact geometry - the problem of infinite dimension. For a symplectic manifold, one can construct a Dirac operator acting on sections of a vector bundle whose fibers are infinite dimensional Hilbert spaces.

These spaces are representations of the double cover of the (linear) symplectic group. They were invented by A. Weil in a context of modular forms and I. E. Segal and D. Shale who searched for a quantization of Klein–Gordon fields.

We recall Habermann's construction of the symplectic Dirac operators and some of her results and describe its analogues in contact projective geometry. Theorems on solution spaces of these operators will be presented.

Kruglikov, Boris – C-projective structures in metric and non-metric situations with large symmetry. For an almost complex structure J and a complex linear connection, J-planar curves are those for which the covariant derivative of the velocity along itself belongs to the complex span of the velocity. This generalizes unparametrized geodesics to the complex situation, and has applications in the theory of Hamiltonian 2-forms in Kähler geometry. The class of complex connections with the same J-planar curves is called a c-projective structure. I first discus how these structures can be viewed as real parabolic geometries, which resolves the equivalence problem for them. Then I discuss how large the symmetry algebras can arise in this geometry. Both general structures and the specification for the case of almost Hermitian / Kähler manifolds will be concerned. In addition to the results on maximal and submaximal symmetry dimensions I describe the corresponding c-projective structures in both metric or non-metric cases. The results are joint with Dennis The (Vienna) and Vladimir Matveev (Jena).

Najberg, Agnieszka – Gradient and divergence on symplectic manifolds. In 1989, Hansklaus Rummler published an article entitled *Differential forms, Weitzenböck formula and foliations*. He introduced there the space of vector-valued forms on the compact oriented Riemannian manifold and extended the ordinary gradient and divergence to the space of the exterior forms.

I introduce the gradient and the divergence in the Rummler sense acting on the space of the forms, which are defined on symplectic manifolds. Those operators have many interesting properties. One of the most notable results is the theorem saying how the gradient and the divergence act on the exterior product of two forms.

An important role in my talk plays the symplectic Hodge star operator, introduced in 1988 by Brylinski. It turns out that this operator commutes with the gradient and with the divergence. Moreover, I investigate the formally adjoint operators (in the symplectic sense) to the gradient and to the symplectic covariant derivative.

Nikolayevsky, Yuri – Locally conformally Berwald manifolds and compact quotients of reducible Riemannian manifolds by homotheties. A Finsler manifold (M, F) is called Berwald if there exists a torsion free affine connection on M whose parallel transport preserves F. Berwald manifolds are well understood, both locally and globally: by a result of Szabo (1981), any Berwald manifold is either Riemannian or can be constructed via a standard procedure from a Riemannian manifold whose holonomy group is not transitive. We will discuss closed locally conformally Berwald manifolds which are not globally conformally Berwald and related Riemannian objects. This is joint work with Vladimir Matveev, Jena.

Nikonorov, Yurii G. – On Killing vector fields of constant length on homogeneous Riemannian manifolds. Recently Ming Xu and Joseph A. Wolf obtained the classification of normal Riemannian homogeneous spaces G/H with nontrivial Killing vector field of constant length, where G is compact and simple. Each of these spaces with $\dim(G) > \dim(H) > 0$ is locally symmetric and its universal Riemannian cover is either an odd-dimensional sphere of constant curvature, or a Riemannian symmetric space $SU(2n)/Sp(n)$. This result is very important in the context of the study of general Riemannian homogeneous manifolds with nonzero Killing fields of constant length.

In this talk, we present some structural results on the Lie algebras of transitive isometry groups of a general compact homogenous Riemannian manifold with nontrivial Killing vector fields of constant length. Informally, the main result could be stated as follows: If the compact homogeneous Riemannian manifolds admits a Killing vector field of constant length, then either it

admits "many" Killing fields of constant length or it has a "very special" group of isometry. It is interesting to point out relations of this property with the structure of Hermitian symmetric spaces.

Origlia, Marcos M. – Locally conformally symplectic structures on nilpotent or almost abelian Lie groups. Locally conformally symplectic (or LCS) forms were introduced by Lee and Vaisman. They are non-degenerate 2-forms ω for which there exists a closed 1-form θ, called the Lee form, satisfying $d\omega = \theta \wedge \omega$.

In the first part of the talk we study left-invariant LCS structures on nilpotent Lie groups. We point out a connection between LCS structures and both contact pairs and contact geometry. We give a complete list of 6-dimensional nilpotent Lie algebras which admit LCS structures. In the second part we characterize the unimodular almost abelian Lie groups that admit left-invariant LCS structures and we study the existence of lattices in order to obtain examples of compact solvmanifolds with an LCS structure. Among these LCS structures, we determine which ones arise from a locally conformal Kähler metric. This is a joint work with Adrián Andrada.

Otiman, Alexandra – Locally conformally symplectic forms. A locally conformally symplectic (LCS) form is an almost symplectic form ω such that a closed one-form θ exists with $d\omega = \theta \wedge \omega$. A fiber bundle with LCS fiber (F, ω, θ) is called LCS if the transition maps are diffeomorphisms of F preserving ω (and hence θ). We find conditions for the total space of an LCS fiber bundle to admit an LCS form which restricts to the LCS form of the fibers. This is done by using the coupling form introduced by Sternberg and Weinstein in the symplectic case. The construction is related to a kind of adapted Hamiltonian actions called twisted Hamiltonian

Schäfer, Lars – Six-dimensional bi-Lagrangian nilmanifolds. A symplectic manifold (M, ω) endowed with two transversal Lagrangian foliations is called a *bi-Lagrangian manifold* or a *para-Kähler manifold*. In this talk we present the classification of six-dimensional nilmanifolds admitting a para-Kähler structure and compare this classification to the known list of symplectic six-dimensional nilmanifolds.
After introducing some notions of para-complex and bi-Lagrangian geometry we establish, as a first step to the above result, the classification of para-complex nilmanifolds in dimension six. Then we explain how to extract from this list those nilmanifolds admitting compatible symplectic forms and relate the outcome to the existing list of symplectic nilmanifolds. This is a joint work in progress with David Petrecca, Hannover.

Szancer, Zuzanna – Affine hypersurfaces with an induced almost paracontact metric structure. We study real affine hypersurfaces $f\colon M \to \mathbb{R}^{2n+2}$ with an almost paracontact structure (φ, ξ, η) induced by a $\widetilde{J}$-tangent transversal vector field, where $\widetilde{J}$ is the canonical para-complex structure on $\mathbb{R}^{2n+2}$. We give a classification of hypersurfaces for which an induced almost paracontact structure is metric relative to the second fundamental form. Some other properties of such hypersurfaces are also studied.

Tadano, Homare – Galloway type theorem for complete Sasaki manifolds. In this talk, we shall give a Galloway type theorem for complete Sasaki manifolds. In particular, our result improves a Myers diameter estimate for complete Sasaki manifolds obtained by Nitta.

Taimanov, Iskander – On a high-dimensional generalization of Seifert fibrations. The notion of generalized Seifert fibration is introduced, it is shown that the projections of certain Eschenburg 7-manifolds onto CP^2 define such fibrations, and for them the characteristic classes corresponding to the generators of $H^2(B(U(2)/Z_{2n}); Z)$ are defined.

Weber, Patrick – Seiberg-Witten invariants as a tool to distinguish contact structures on diffeomorphic 5-manifolds. After reviewing some basics of Seiberg-Witten theory, I will show how the invariants can be used to distinguish different foliations on diffeomorphic manifolds, emphasizing the particular case of K-contact / Sasakian 5-manifolds. The talk is based upon the recent preprint "Seiberg-Witten invariants on manifolds with Riemannian foliations of codimension 4", joint work with Mehdi Lejmi.

Winther, Henrik – Strictly nearly pseudo-Kähler manifolds with large symmetry groups. We consider strictly nearly pseudo-Kähler manifolds of dimension 6 and a closely related generalization of these called non-degenerate almost complex structures. We explore the relationship between these and use this to determine the maximal, sub-maximal and sub-sub-maximal symmetry dimension of such spaces and give a complete list of examples realizing these symmetry dimensions. Joint work with B. Kruglikov.

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Poster session

The poster session includes contributions by:

- Bukusheva, Aliya – An example of admissible hyperkähler structure on the contact distribution
- Dudek, Marta
- Galaev, Sergei – Almost contact metric structures defined by an N-prolonged connection
- Storm, Reinier – On the classification of naturally reductive homogeneous spaces
- Vasilev, Stefan – Connections with skew torsion acting on differential forms

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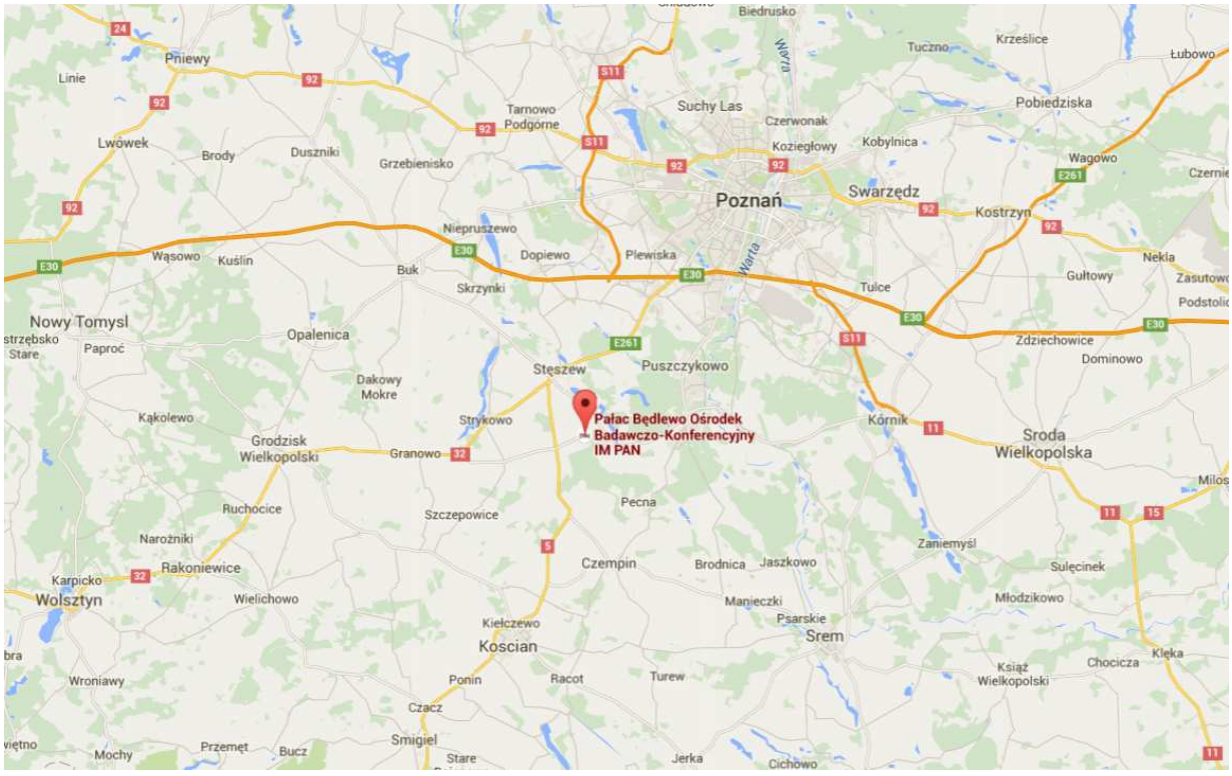
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