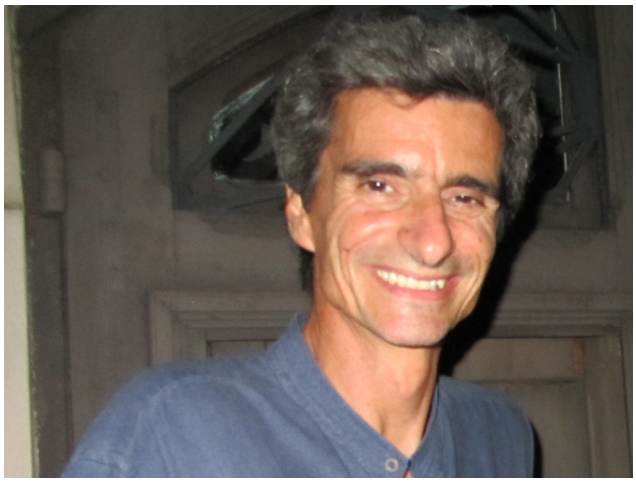
Max LX

Miniworkshop on Non-Kählerian Geometry



Book of abstracts

Speakers

Fiammetta Battaglia (Firenze)
Paul Gauduchon (École Polytechnique Palaiseau)
Andrei Moroianu (Paris-Sud)
Alexandra Otiman (Roma Tre)
Paolo Piccinni (Roma Sapienza)
Fabio Podestà (Firenze)
Simon Salamon (London)
Adriano Tomassini (Parma)
Victor Vuletescu (București)

Organizers

Daniele Angella (Firenze)
Liviu Ornea (București)

Dipartimento di Matematica e Informatica "Ulisse Dini", Università di Firenze
May 27–28, 2019

Participants

Angella Daniele (Firenze)
Battaglia Fiammetta (Firenze)
Bisi Cinzia (Ferrara)
Bonechi Niccolò (Firenze)
Calamai Simone (Firenze)
Cattaneo Andrea (Firenze)
Flavi Cosimo (Firenze)
Gauduchon Paul (École Polytechnique Palaiseau)
Gentili Graziano (Firenze)
Giusti Federico (Firenze)
Gori Anna (Milano)
Istrati Nicolina (Tel Aviv)
Kai Brynne Boydon (Philippines)
Lu Kevin Ong (Philippines)
Moroianu Andrei (Orsay)
Nannicini Antonella (Firenze)
Ornea Liviu (București)
Otiman Alexandra (Roma Tre)
Pacini Tommaso (Torino)
Paradiso Fabio (Torino)
Parton Maurizio (Pescara)
Pediconi Francesco (Firenze)
Piccinni Paolo (Roma Sapienza)
Podestà Fabio (Firenze)
Pontecorvo Max (Roma Tre)
Salvatore Francesca (Torino)
Sferruzza Tommaso (Firenze)
Stoppato Caterina (Firenze)
Tardini Nicoletta (Firenze)
Tomassini Adriano (Parma)
Vanni Pietro (Firenze)
Verdiani Luigi (Firenze)
Vuletescu Victor (București)
Zedda Michela (Parma)
Zoller Leopold (Marburg)

Talks

Hirzebruch surfaces in a one-parameter family

Monday 27th, 10:30

Fiammetta Battaglia

Almost complex structures on quaternion-Kaehler manifolds

Tuesday 28th, 12:00

Paul Gauduchon

Locally conformally Khler manifolds with holomorphic Lee field

Monday 27th, 16:00

Andrei Moroianu

Abstract. A locally conformally Khler (LCK) manifold is a compact Hermitian manifold (M,g,J) whose fundamental 2-form $\omega := g(J\cdot,\cdot)$ verifies $d\omega = \theta \wedge \omega$ for a certain closed 1-form θ called the Lee form. We study here LCK manifolds whose Lee vector field (the metric dual of θ) is holomorphic. We will show that if its norm is constant or if its divergence vanishes, then the metric is Vaisman, i.e. the Lee form is parallel with respect to the Levi-Civita connection of g. We will then give examples of non-Vaisman LCK manifolds with holomorphic Lee field, and we classify all such structures on manifolds of Vaisman type. These results have been obtained in collaboration with F. Madani, S. Moroianu, L. Ornea and M. Pilca.

Hermitian and Complex Geometry of a subclass of Kato manifolds

Tuesday 28th, 10:30

Alexandra Otiman

Remarks on some 4-forms in $\mathbb{R}^8$ and $\mathbb{R}^{16}$

Monday 27th, 09:30

Paolo Piccinni

Abstract. It will be a linear algebra talk, with just a few applications to some classes of Riemannian manifolds of dimension 8 and 16. I will talk about some exterior or differential 4-forms, naturally associated in these dimensions with structures related with quaternions and octonions, as well as with the notions of Clifford system and of even Clifford structure.

TBA

Monday 27th, 12:00

Fabio Podestà

Quotients of twistor space

Monday 27th, 17:00 *(videoconference)*

Simon Salamon

Abstract. I shall discuss the Hopf fibration $\mathbb{CP}^3 \to \mathbb{S}^4$ in the somewhat unusual light of the action of a circle subgroup on $\mathbb{R}^5$. This will be related to metrics with holonomy $\mathrm{SU}(2)$ and G_2, and a mysterious $\mathrm{SU}(3)$ structure on a singular version of $\mathbb{R}^6$.

On the J-anti-invariant and symplectic cohomologies

Tuesday 28th, 09:30

Adriano Tomassini

Abstract. We will present some recent results obtained in two joint papers with Nicoletta Tardini and Richard Hind, concerning the cohomolgy of symplectic and almost complex manifolds.

Let J be an almost complex structure on a $2n$-dimensional manifold M. Then J acts in a natural way on the bundle of 2-forms $\Lambda^2(M)$, so that

$$\Omega^2(M) = \Omega^+_J(M) \oplus \Omega^-_J(M),$$

where $\Omega^2(M)$ is the space of smooth sections of $\Lambda^2(M)$ and $\Omega^-_J(M)$ denote the space of J-invariant and J-anti-invariant forms, respectively. Therefore, it is natural to consider the cohomology subgroups

$H_J^+(M)$, $H_J^-(M)$ of $H^2_{dR}(M;R)$ whose elements are de Rham classes represented by J-invariant respectively J-anti-invariant forms.
We will describe some features of the anti-invariant cohomology. Furthermore, we discuss some properties of the Bott-Chern symplectic cohomology.

Locally conformally Kähler surfaces: a survey

Monday 27th, 14:30

Victor Vuletescu

Abstract. We present a mostly self-contained proof of the classification of non-Kähler surfaces based on Buchdahl-Lamari theorem. There are no new results, but we give some simplification of the old proofs. This is joint work with M. Verbitsky and L. Ornea.

Timetable

The conference will take place at:

Aula Tricerri (first floor),
Dipartimento di Matematica e Informatica "Ulisse Dini", Università di Firenze,
viale Morgagni 67/A, Firenze, Italy
https://osm.org/go/xX66_gQ8C?way=43977147.

	monday 27th	**tuesday 28th**
09:30-10:30	Paolo Piccinni	Adriano Tomassini
10:30-11:30	Fiammetta Battaglia	Alexandra Otiman
11:30-12:00	*coffee break*	*coffee break*
12:00-13:00	Fabio Podestà	Paul Gauduchon
13:00-14:30	*lunch break*	*lunch break*
14:30-15:30	Victor Vuletescu	
15:30-16:00	*coffee break*	
16:00-17:00	Andrei Moroianu	
17:00-17:40	Simon Salamon *(videoconf)*	
20:00	*social dinner*	

The social dinner will take place at:

La Cucina del Ghianda (http://www.lacucinadelghianda.it/)
Via dell'Agnolo, 85R, Firenze
https://osm.org/go/xdQQCDmB1?node=2361949847
(cost: around 20€ for students and postdocs, around 35€ for professors)