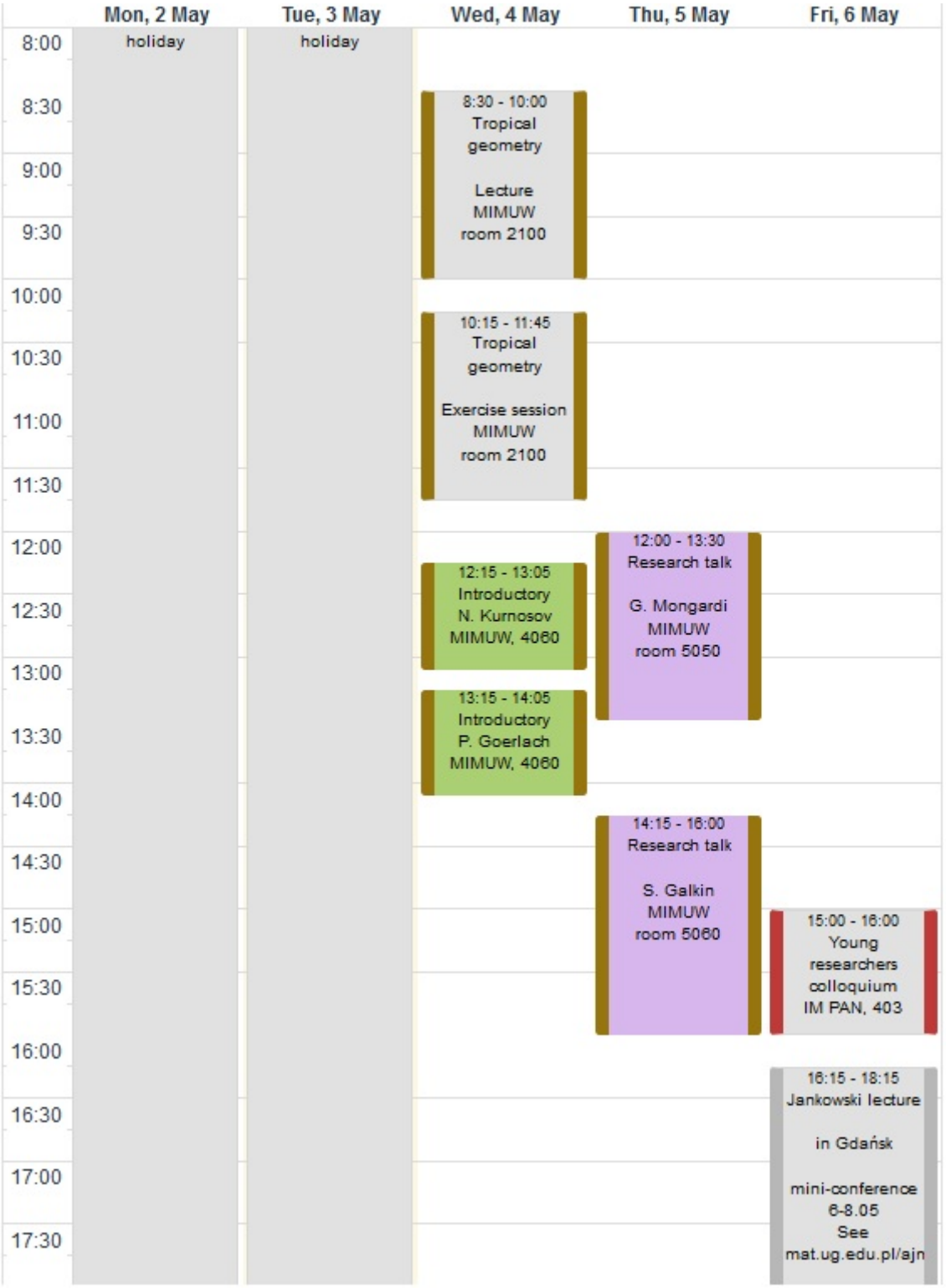
Schedule

Week III: 2 – 8 May 2016



Border colors denote locations, whereas background corresponds to the type of event.

Border colors / Locations:

- IM PAN Śniadeckich 8
- MIMUW Banacha 2
- Other locations

Event types:

- introductory lectures, which should be accessible to undergraduate students and even "greenhorns"
- research talks
- other activities such as social events or related Math talks that are not part of miniPAGES

Abstracts

Week III: 2 – 8 May 2016

Sergey Galkin

Research talk: Hyperkähler manifolds and modular forms

One-dimensional moduli spaces of lattice-polarised hyperkähler manifolds tend to be the usual modular curves with respect to some congruence subgroups in $\mathrm{SL}(2, R)$, and the periods of the respective Picard–Fuchs equations are the usual modular forms. First of all, this suggests that the respective hyperkähler manifolds with large Picard number are isogeneous to powers of elliptic curves, similarly to the theory of Inose–Shioda and Morrison. Also mirror symmetry together with explicit computations of the respective differential equations and periods might help with providing new constructions of hyperkähler manifolds polarised by a single ample divisor.

I will show some computations with Jacobians of hyper-elliptic curves, varieties of lines on cubic fourfolds, and some other varieties with special holonomy, that provide evidence the this statements. The computations have two interpretations — in B setting one computes periods of a universal 1-parameter family of varieties, and in A setting interpretations the coefficients of the respective periods should have some enumerative invariants, however we don't know what objects they do actually count.

Paul Görlach

Introductory lecture: The Cone Conjecture for Calabi-Yau varieties

The Cone Conjecture predicts that the Nef cone of a Calabi-Yau variety is finite rational polyhedral up to the action of the automorphism group. I will present different versions of this conjecture and their consequences and give an overview of the current progress.

Nikon Kurnosov

Introductory lecture: Inequlities involving Betti numbers of hyperkähler manifolds

There are known two infinite series of simple hyperkähler manifolds – the Hilbert Schemes of points on K3 and the generalized Kummer varieties, and two sporadic examples of O'Grady in dimension six and ten. I will explain boundedness conditions for the second Betti number and inequalities involving Betti numbers which follow from Rozansky-Witten invariants and an $\mathrm{so}(4, b_2 - 2)$-action on the cohomology of hyperkähler manifolds.

Giovanni Mongardi

Research talk: The O'Grady's six dimensional manifold as a quotient

This work is joint with A. Rapagnetta and G. Saccà, we construct one of the exotic examples of holomorphic symplectic manifolds as the quotient by a non regular involution on the Hilbert scheme of three points on a Kummer surface. We use this construction to compute Hodge numbers of the O'Grady's sixfold and, time permitting, I will sketch additional properties of this manifold which can be obtained from this construction.