

# Schedule of the Talks

## May 18, Monday

11:00 E. Çineli (İstanbul)

Correspondence theorem in tropical geometry

**Abstract:** We will make a self-contained introduction to tropical geometry in  $R^2$ . The aim is to develop terminology, and state G. Mikhalkin's correspondence theorem, which says that the number of curves of genus  $g$  and degree  $d$ , passing through  $3d + g - 1$  points in general position, is the same for both complex and tropical curves.

15:15 H. Güntürkün (İzmir)

Tropical Lines

**Abstract:** This will be an introductory talk on Tropical Geometry. We will talk about the tropical lines. We will sketch the tropical lines using Tropical Semifield (max-plus algebra), amoebas (tropical limit) and Puiseux series. We will give essential background to keep the talk self contained. Then we will take two lines and tropicalize them to see the intersection relations. If time permits, we will give the tropical lines in higher dimensions (also some other varieties). Then we will talk about Berkovich spaces and relation of it with the tropical geometry.

## May 19, Tuesday

11:00 M. Tosun (İstanbul)

Triple root systems and free divisors

**Abstract:** We extend the definition of a root system to the rational triple singularities. Then we associate a representation to the resolution graphs of rational triple singularities by taking them as quivers and we show that the discriminant of such a representation is a linear free divisor. This is a joint work with A.Altnta and K.Nakamoto.

14:00 S. Galkin (Moscow)

Joins and Hadamard products

**Abstract:** Given two elliptic curves of small degree I will smooth out their join to obtain new (and old) interesting (and boring) examples of Calabi-Yau threefolds. Then I also explain how the generating function for the numbers of rational curves on these threefolds is related to the Hadamard product of the generating functions of rational curves on the respective elliptic curves (or, rather, their enveloping del Pezzo surfaces). The construction of mirrors

for these threefolds is also very straightforward: the respective potential has form  $F(x)G(y)$ , where  $F(x)$  and  $G(y)$  are mirror potentials to the original elliptic curves. Existence of some of CY3 with the respective Gromov-Witten invariants (respectively, periods) was predicted by Mainz group (van Enckewort, van Straten, Almkvist, Zudlin, ...). The construction also works for smoothing some other joins and computing their GromovWitten invariants, double covers being another interesting example.

## May 20, Wednesday

11:00 G. Mikhalkin (Genève)

Logarithmic area of real plane curves and their refined enumeration

**Abstract:** We note that under certain conditions, the logarithmic images of real plane curves bound regions whose areas are half-integer multiples of pi square. The half-integer number can be interpreted as a quantum index of the real curve and used to refine real enumerative geometry in a way consistent with the Block-Göttsche invariants from the tropical world.

14:00 Burak Ozbagci (İstanbul)

Contact open books with exotic pages

**Abstract:** (This is a joint work with Otto van Koert) We consider a fixed contact 3-manifold that admits infinitely many compact Stein fillings which are all homeomorphic but pairwise non diffeomorphic. Each of these fillings gives rise to a closed contact 5-manifold described as a contact open book whose page is the filling at hand and whose monodromy is the identity symplectomorphism. We show that the resulting in finitely many contact 5-manifolds are all diffeomorphic but pairwise non-contactomorphic.

## May 21, Thursday

10:00 S. Finashin (Ankara)

Real Cayley M-octads and typical projective 7-configurations

**Abstract:** Real deformational classification of planar typical 7-configurations (in Ph.D thesis of A.Zabun) via Gale duality leads to a similar classification of special 7-configurations, which is related to classification of maximal real Cayley octads (8-configurations being the zero locus of a net of quadric surfaces). I will describe the 8 deformation classes of regular octads relating them to the associated even theta-characteristics on the spectral quartic and the corresponding 14 real deformation classes of 7-configurations.

## May 22, Friday

11:00 I. Itenberg (Paris)

Real relative enumerative invariants

**Abstract:** We discuss real analogs of relative Gromov-Witten invariants in several situations. In particular, in the case of real del Pezzo surfaces with a real  $(-2)$ -curve, we suggest an invariant signed count of real rational curves that belong to a given divisor class and are tangent to the  $(-2)$ -curve at each intersection point (joint work with V. Kharlamov and E. Shustin).

14:00 Tolga Etgü (İstanbul)

Koszul duality patterns in Floer theory

**Abstract:** We study symplectic invariants of the open symplectic manifolds  $X$  obtained by plumbing cotangent bundles of spheres according to a plumbing tree. We prove that certain models for the Fukaya category of closed exact Lagrangians in  $X$  and the wrapped Fukaya category are related by Koszul duality. As an application, we give explicit computations of symplectic cohomology of the symplectic manifolds  $X$  for all trees but the exceptional cases  $E6$ ,  $E7$  and  $E8$ . This is joint work with Yanki Lekili.

## May 23, Saturday

11:00 A. Degtyarev (Ankara)

Slopes of links

**Abstract:** (joint work in progress with Vincent Florens and Ana G. Lecuona)

This work is motivated by our previous study of the behavior of the signature of colored links under the splice operation. The signature is mainly additive, away from a certain "singular locus", which is the subject of our current work. To describe the extra correction term (arising as a certain Maslov index in Wall's non-additivity theorem), we introduce a collection of polynomial invariants of colored links, called slopes. It turns out that the slope can be represented as the ratio of two sign-refined Alexander polynomials (or rather derivatives thereof), whenever this ratio makes sense. However, experiments with the link tables show that, when both polynomials in question vanish, the rational function obtained is independent of the higher Alexander polynomials, thus providing a new link invariant. This invariant distinguishes some of the links in the tables. Even the isolated common zeroes of the two polynomials sometimes lead to surprises.

Should time permit, we will study the further properties of these invariants and discuss various ways to compute them.