For Favour of posting

The Hong Kong University of Science and Technology

Department of Mathematics

Hong Kong Geometry Colloquium

Point-arrangements in the real projective spaces and the Fibonacci polynomials

By

Prof. Masaaki YOSHIDA

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Abstract

In this report, arrangements of $n + 2$ points in general position in the real projective n-space are unique up to projective transformations. Those of $m := n + 3$ points are projectively not unique, but they are combinatorially unique. We are interested in arrangements of m points which admit an action of the cyclic group of order m.

Let $p_1, \cdots, p_{n+2}$ be $n + 2$ points in general position. We add another point p_m and require that the m points $p_1, \cdots, p_{n+2}, p_m$ admit a projective transformation σ inducing the cyclic permutation:

$$\sigma : p_1 \to p_2 \to \cdots \to p_{n+2} \to p_m \to p_1$$

There always exist such p_m and σ, and in fact there are several choices in general. We show that such choices exactly correspond to the roots of the *Fibonacci polynominal* $F_n(t)$ of degree $[n/2] + 1$. And moreover, the resulting m points $p_1, \cdots, p_{n+2}, p_m$ are in general position if and only if the corresponding root is "primitive", i.e., a root of the *core Fibonacci polynomial* $f_n(t)$, which is an irreducible factor of $F_n(t)$ of degree $\varphi(m)/2$. Here, $\varphi(m)$ denoted Euler's function counting the number of positive integers less than m and co-prime to m.

Date : Saturday, 10 February 2018
Time : 10:00a.m.-11:00a.m.
Venue : Room 4504, Academic Building (near Lifts 25&26), HKUST

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Admissible height pairings of algebraic cycles

By

Prof. Shouwu ZHANG

Princeton University and IAS of HKUST

Abstract

For a smooth and projective variety X over a global field of dimension n with an adelic polarization, we propose canonical local and global height pairings for two cycles Y, Z of pure dimension p, q satisfying p+q=n-1. We will give some explicit arichmedean local pairings by writing down explicit formula for the diagonal Green current for some Shimura varieties.

Date : Saturday, 10 February 2018
Time : 11:20a.m.-12:20p.m.
Venue : Room 4504, Academic Building (near Lifts 25&26), HKUST

All are welcome!

Light refreshment will be provided at Room 3493 from 11:00 am to 11:20 am
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