Seminar on Algebra, Geometry and Physics: A Homage

The seminar of Yuri Ivanovich Manin started in Moscow and existed for more than half a century. With the passing away of Yuri Ivanovich in January 2023, it has been decided that the seminar will be discontinued, as it had always been tailor-made to his personality. We wish to honor the influence of the seminar, which offered a platform to many mathematicians, and pay homage to its creator. After a brief historical recollection by Mikhail Kapranov, we will end the seminar with two talks by Don Zagier and Matilde Marcolli, who were colleagues of Yuri Ivanovitch and knew him well.

Program

Tue, 21 Feb 2023

13:30 - 13:45	MIKHAIL KAPRANOV (KAVLI IPMU) **Y. I. Manin's seminars in Moscow**
13:45 - 14:45	DON ZAGIER (MPIM) **Reduction theory and periods of modular forms**
14:45 - 15:00	**Break**
15:00 - 16:00	MATILDE MARCOLLI (CALTECH) **The Last Lecture: Computability Questions in the Sphere Packing Problem**

Abstracts

MIKHAIL KAPRANOV

Y. I. Manin's seminars in Moscow

Historical remarks after notes and recollections by V. Berkovich, I. Cherednik, V. Drinfeld, M. Kapranov, V. Shokurov, Y. Tschinkel, A. Voronov, Y. Zarhin.

DON ZAGIER

Reduction theory and periods of modular forms

Among Manin's most beautiful and influential contributions to number theory was his study of periods of modular forms, in particular the theory of modular symbols and his algebraicity theorem for the periods of cusp forms, both of which are related to the theory of continued fractions. After reviewing this material, I will turn to the inverse problem of determining a cusp form from its periods and will describe a complete solution for the case of the full modular group. This result, which I found more than 25 years ago and had always intended to dedicate to Manin, depends on a simple but surprising lemma about continued fractions. But for the solution of the corresponding result for other Fuchsian groups I needed to establish a rather beautiful statement about reduction theory that I discovered experimentally and checked in many cases, so I kept postponing the publication and dedication until this question could be resolved and I could give the complete result. This still has not happened, and I have decided to belatedly present what I already know.

MATILDE MARCOLLI

The Last Lecture: Computability Questions in the Sphere Packing Problem

I will dedicate this last lecture of Manin's "Algebra, Geometry, and Physics" seminar to present his last work (and our last joint work) on computability questions arising naturally in the context of the sphere packing problem. I will show how our previous results on Kolmogorov complexity and the asymptotic bound for error correcting codes can provide some insight on this problem.