

The 7th Daniel Kan Memorial Lectures

‘Lectures on Adjoint functors, continued fractions and categorified perverse sheaves’

Mikhail Kapranov (Tokyo)

Utrecht, 12-13 October 2023

Thursday 12 October

15.30 **Tea**

16.00-17.00 **Mikhail Kapranov** – Adjoint functors, continued fractions and categorified perverse sheaves I
Koningsberger Building, Lecture Hall Pangea, first floor

17.30 **Drinks:** *in Library, Hans Freudenthal Building*

Friday 13 October

13:00 **Lunch:** *in Library, Hans Freudenthal Building*

14.30-15.30 **Mikhail Kapranov** – Adjoint functors, continued fractions and categorified perverse sheaves, II
Koningsberger Building, Lecture Hall Pangea, first floor

16.00-17.00 **Mikhail Kapranov** – Adjoint functors, continued fractions and categorified perverse sheaves, III
Koningsberger Building, Lecture Hall Pangea, first floor

Koningsberger building:
Budapestlaan 4ab, 3584 CD Utrecht

Hans Freudenthal Building and Library:
Budapestlaan 6, 3584 CD Utrecht | The library is on the 7th floor; turn left when leaving the elevator.

Please see abstract on the next page

Abstract: Continued fractions (CF) are a beautiful chapter of classical analysis. Remarkably, some algebraic aspects of CF find their analogs in the very foundations of category theory: in relation to the concept of adjoint functors introduced by D. Kan in 1958. More precisely, Euler's continuants (the universal polynomials expressing the numerators and denominators of convergents of a CF) lift to certain complexes built out of a given functor and its iterated adjoints. Requiring exactness of some of these complexes leads to the concept of an N -spherical functor which encompasses ordinary spherical functors for $N=4$. Such functors describe N -periodic semi-orthogonal decompositions of (enhanced) triangulated categories.

The lectures will present the classical continuant formalism, its categorical lifting and the point of view on spherical and N -spherical functors as regular and irregular perverse sheaves (categorified perverse sheaves) on the complex plane. They are based on joint work with T. Dyckerhoff, V. Schechtman and Y. Soibelman.