Reading Seminar:

AdS Geometry & Representations

SoSe 2022

AdS spacetime is the Lorentzian analogue of the hyperbolic plane, i.e. a maximally symmetric Lorentzian manifold of constant negative scalar curvature. Originally studied as a solution to Einstein's field equations with a negative cosmological constant, it has found popularity with both physicists and mathematicians: Higher-dimensional AdS spaces are famous for the role they play in the AdS/CFT correspondence in theoretical physics. On the other hand methods and ideas from AdS geometry can be used to great effect to study representations into $\mathrm{SO}(2, n)$ as seen in the work of Barbot and Mérigot, which is what we will look into this semester.

The first part of the seminar will be an **introduction to AdS geometry**, which should roughly take the first third of the semester. Afterwards, we will study the work of Barbot and Mérigot on **quasi-Fuchsian AdS representations** and if time permits Danciger, Guéritaud and Kassel's paper on **convex cocompactness in pseudo-Riemannian hyperbolic spaces**. Of course, other suggestions are welcome and this plan is subject to change.

References are:

- F. Bonsante, A. Seppi: *Anti-de Sitter Geometry and Teichmüller Theory*, 2020.
- T. Barbot, Q. Mérigot: *Anosov AdS Representations are Quasi-Fuchsian*, 2012.
- J. Danciger, F. Guéritaud, F. Kassel: *Convex Cocompactness in Pseudo-Riemannian Hyperbolic Space*, 2017.

When and where?

We will meet **weekly** on **Mondays, 11.00-12.30** in **SR 3**, starting from April 25, 2022.

Organisers:
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`https://www.mathi.uni-heidelberg.de/~mniemeyer/ads-geometry.html`