

# Conformal Anomaly Workshop

Пятница, 20 января

9:50–10:00		<b>Сбор</b>
10:00–11:20	<b>Дамир Садеков</b>	Конформная аномалия в 2d
11:20–11:40		<b>Coffee</b>
11:40–13:00	<b>Дмитрий Дьяконов</b>	DeWitt-Schwinger expansion. Effective action and conformal anomaly.
13:00–14:00		<b>Обед</b>
14:00–15:20	<b>Кирилл Базаров</b>	Trace anomalies and the Hawking effect.
15:20–15:40		<b>Coffee</b>
15:40–17:00	<b>Прокопий Анемподистов</b>	Conformally invariant quantum field theory in static Einstein space-times
17:00–17:20		<b>Coffee</b>
17:20–17:50	<b>Olaf Baake (online)</b>	BTZ geometries and their quantum backreactions
18:00–...		<b>FLEX</b>

# List of Abstracts

## Конформная аномалия в 2d

*Дамир Садеков*

По книгам:

Polyakov, “Quantum Geometry of Bosonic Strings”

Harold Erbin, “Notes on 2d quantum gravity and Liouville theory”

Polyakov, “Quantum gravity in two dimensions”

Di Francesco, “Conformal field theory”

## DeWitt-Schwinger expansion. Effective action and conformal anomaly.

*Дмитрий Дьяконов*

We consider DeWitt-Schwinger proper time expansion of the two-point function in curved space. We will apply this to calculate the expectation value of the stress energy tensor and effective action in terms of local geometric quantities. The talk is based on <https://inspirehep.net/literature/115046>, the details can be found [here](#).

## Trace anomalies and the Hawking effect.

*Кирилл Базаров*

The general spherically symmetric, static solution of  $\nabla_{\mu} T^{\mu\nu} = 0$  in the exterior Schwarzschild metric is expressed in terms of two integration constants and two arbitrary functions. It contains divergent terms, we will discuss their physical meaning. The talk is based on <https://inspirehep.net/literature/124645>

## Conformally invariant quantum field theory in static Einstein space-times

*Прокопий Анемподистов*

Stress-energy tensor via conformal transformations abstract: we will describe a method to determine SET of conformal matter in curved space time using conformal transformations. Based on <https://doi.org/10.1103/PhysRevD.19.2902>

## BTZ geometries and their quantum backreactions

*Olaf Baake (online)*

We discuss the semiclassical backreaction of a conformally coupled scalar field on the family of BTZ geometries, where our focus is the overspinning case, that is,  $|M|l > |J|$ . Using the renormalized quantum stress-energy tensor for a conformally coupled scalar field on such a spacetime, we obtain the semiclassical Einstein equations, which we attempt to solve perturbatively. Contrary to the other cases of the BTZ spectrum, the stress-energy tensor turns out to be non-renormalizable in this approach, and consequently the perturbative solution to the semiclassical equations in the overspinning case does not exist. It is therefore a special case of the family of BTZ geometries, where the naked singularity cannot be dressed by an event horizon through quantum backreactions and could indicate that it is of a more severe nature than the conical singularity found in the same family of BTZ geometries.