

String Theory in Greater Tokyo

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Kavli IPMU greeted 2015 by hosting the inaugural workshop in a new series, String Theory in Greater Tokyo. The workshop series is aimed at bringing together researchers in string theory and related fields from throughout Tokyo and the surrounding prefectures.

Each workshop is a one-day event held at a different institution in the Tokyo area. The workshops offer several talks by well-known researchers in various fields, but also place a strong emphasis on interaction and collaboration between participants. The next workshop will be organized by the high energy physics group at RIKEN, on June 9, 2015.

The inaugural workshop took place on January 19, and was organized by the Kavli IPMU members Simeon Hellerman, Charles Melby-Thompson, René Meyer, and Masahito Yamazaki. There were roughly 50 scientists in attendance.

We were pleased to welcome as the series' first lecturers Prof. Xi Yin (Harvard University), Dr. Dionysios Anninos (Institute for Advanced Study), and Prof. Daniel Grumiller (Vienna University of Technology).

Recent developments in little string theory found a clear expositor in the first talk by Prof. Xi Yin. He discussed

his recent work on scattering amplitudes in double scaled little string theory and the UV completion of 6D super Yang-Mills theory. By expressing correlators in little string theory in terms of correlation functions of exactly solvable CFTs, he could compute numerical coefficients in the α' expansion. The results shed light on the structure of the perturbation theory expansion of 6d super Yang-Mills.

The second talk by Dr. Dionysios Anninos dealt with the long-standing problem of defining a consistent quantum theory on de Sitter space-time. His approach was to constrain the theory using holography. In Vasiliev's theory of higher spin gravity he calculated the de Sitter entropy, and argued that his result implies an upper bound on the number of degrees of freedom produced during inflation, hence predicting additional correlations in the Cosmic Microwave Background. He finished with several

thoughts about promising lines of attack on this long-standing problem.

Prof. Daniel Grumiller's lecture was on three-dimensional gauge-gravity duality beyond AdS/CFT. He discussed several ideas extending AdS/CFT in three dimensional toy models of gravity, including higher derivative gravity, higher spin gravity, and holography in flat space. One very interesting program regards extending the AdS/CFT correspondence to non-unitary systems. His clear exposition was of great help to those interested in pushing the envelope of the gauge-gravity correspondence.

In addition to the talks, participants also appreciated ample time for interaction with other researchers. Many introductions were made and new contacts formed, making the workshop a promising start to what we hope becomes a long tradition at Kavli IPMU and throughout Greater Tokyo.

