スーパーグローバルコース数学特別講義 4

The restricted three-body problem and holomorphic curves

September 3-7, 2018

Monday, Sep. 3	13:30-15:30
Tuesday, Sep. 4	10:00-12:00
Wednesday, Sep. 5	10:00-12:00
Thursday, Sep. 6	10:00-12:00
Friday, Sep. 7	10:00-12:00

127 Conference Room
Faculty of Science Bldg. #3
Kyoto University

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The restricted three-body problem describes the dynamics of a massless particle attracted by two masses. For example the massless particle could be the moon and the masses earth and sun, or a satellite attracted by the earth and moon, or a planet attracted by two stars in a double star system. Different from the two-body problem which is completely integrable the dynamics of the restricted three-body problem has chaotic behaviour.

A global surface of section reduces the complexity of the dynamics by one dimension. More than hundred years ago Birkhoff made a conjecture about the existence of a global surface of section for the restricted three-body problem. Although the question about existence of a global surface of section is a question about all orbits, holomorphic curves allow to reduce the Birkhoff conjecture to questions involving periodic orbits only.

In the lecture I explain the theory of holomorphic finite energy planes, what they imply for the Birkhoff conjecture, and what challenges remain to be done to prove the conjecture.

❖ 本講義は「スーパーグローバルコース数学特別講義 4」として大学院の学生には1単位認定されます。

Night View of Saruwaka-machi (One Hundred Famous Views of Edo), Utagawa Hiroshige