



Mon, July 10 - Fri, July 14, 2017  
14:45 - 17:15

**I27 Conference Room**

Faculty of Science Bldg. #3, Kyoto University

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Landau Institute for Theoretical Physics

# W-algebras - introduction, screenings and quantum groups

❖ 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。

Sometimes people use the words vertex operator algebra and W-algebra as synonyms. This is partly correct, but not entirely. Theory of W-algebras is a collection of extremely interesting examples of new algebraic objects and theory of vertex algebra is an attempt to understand and find some order in this zoo.

Our lectures are the introduction - so we concentrate on examples and simplest methods of constructing the W-algebras. Note that W-algebras are deeply connected with 2-dimensional conformal field theory. So it is not possible to talk about W-algebras and do not mention some facts from the algebraic geometry of the curves.

1. Clifford algebra, Lattice vertex operator algebras.
2. Coinvariants and vertex operators.
3. Subalgebras in lattice vertex algebras. Screenings. Quantum groups and screenings.
4. Fermionic screenings. Algebra  $\widehat{\mathfrak{sl}}(2)$  on a critical level.
5. Deformation of universal enveloping of the Lie algebra of differential operators on the circle.
6. Plane partitions and W-algebras. (something about recent progress)

No particular knowledge on representation theory is required.



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