

**The University of Chicago**  
**ALGEBRAIC GEOMETRY SEMINAR**

Wednesday, June 3<sup>rd</sup>, 2015  
4:30 – 6:00 pm, Eckhart 312

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**Double ramification cycles and integrable systems**

In a series of papers with A. Buryak and B. Dubrovin we are studying the algebraic structure behind the intersection theory of the double ramification cycle, a cycle inside the moduli space of stable marked curves, heuristically representing (a compactification of) the locus of those Riemann surfaces whose marked points support a principal divisor. It turns out that natural generating functions of intersection numbers produce infinite dimensional integrable Hamiltonian systems (this part was inspired by Eliashberg's symplectic field theory) and even previously unknown quantization of such field theories. Buryak has conjectured that these systems are equivalent to the Dubrovin-Zhang systems involved in Witten's conjecture and we have gathered quite some evidence of this fact, proving it in a number of special cases. This is a typical and quite new application of moduli space geometry to mathematical physics and I will outline its main ideas and results.