# Instanton sheaves and components of the moduli space of semistable sheaves on the projective space

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Recent results by Tikhomirov, and by the author and Verbitsky have answered old questions about the geometry of the moduli space I(c) of rank 2 instanton bundles of charge c on the projective space: we now know that this is an irreducible, non-singular affine variety of dimension 8c-3. The next step is to study its compactification.

Since every rank 2 instanton bundle on $P^3$ is stable, I(c) can be regarded as an open subset of the Gieseker--Maruyama scheme M(c) of semistable rank 2 torsion free sheaves on $P^3$ with Chern classes $c_1 = c_3 = 0$ and $c_2 = c$. One can then consider the closure of I(c) within M(c).

In this talk we show that the singular locus of non-locally free rank 2 instanton sheaves on $P^3$ have pure dimension 1. We then describe certain irreducible components of the boundary of I(c) with dimension 8c-4. Such components consist of stable, non-locally free rank 2 instanton sheaves whose singular loci are rational curves. In addition, we describe new components of M(3) and M(5) consisting of stable, non-locally free rank 2 instanton sheaves whose singular loci are elliptic curves.

The results presented are joint work with M. Gargate and with D. Markushevich and A. S. Tikhomirov.