# DEFORMATIONS OF SYMPLECTIC SINGULARITIES AND ORBIT METHOD

DIJON, JULY 3-7, 2017

In these lectures we will discuss various questions related to orbits of the adjoint action of a semisimple algebraic group on its Lie algebra.
A preliminary plan is as follows.

(1) Nilpotent orbits in semisimple Lie algebras. Singular symplectic varieties.
(2) $\mathbb{Q}$-factorial terminalizations of singular symplectic varieties. Lusztig-Spaltenstein induction for adjoint orbits.
(3) Deformation of singular symplectic varieties. Sheets and birational sheets in semisimple Lie algebras.
(4) Primitive ideals in universal enveloping algebras and orbit method.

**Prerequisites:** Complex semisimple algebraic groups. Structure and representation theory of complex semisimple Lie algebras.

Participants who wish to do some preliminary work may try to solve problems in Section 1 of the attached problem sheet, although this is not a requirement.

## References


[1] Collingwood, David H. ; McGovern, William M. Nilpotent orbits in semisimple Lie algebras. Van Nostrand Reinhold Mathematics Series. Van Nostrand Reinhold Co., New York, 1993. xiv+186 pp. ISBN: 0-534-18834-6

[2] Fu, Baohua . A survey on symplectic singularities and symplectic resolutions. Ann. Math. Blaise Pascal 13 (2006), no. 2, 209–236.

[3] Losev, Ivan. Deformations of symplectic singularities and Orbit method for semisimple Lie algebras. Preprint (arXiv:1605.00592).

[4] Namikawa, Yoshinori . Poisson deformations of affine symplectic varieties. Duke Math. J. 156 (2011), no. 1, 51–85.

[5] Namikawa, Yoshinori . Poisson deformations of affine symplectic varieties, II. Kyoto J. Math. 50 (2010), no. 4, 727–752.