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## **Interactions of symplectic topology with singularity theory: Lagrangian pinwheels, Klein bottles and Milnor links of singularities**

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### **Citation**

Adaloglou, N. (2025, October 10). *Interactions of symplectic topology with singularity theory: Lagrangian pinwheels, Klein bottles and Milnor links of singularities*. Retrieved from <https://hdl.handle.net/1887/4267032>

Version: Publisher's Version

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**Note:** To cite this publication please use the final published version (if applicable).

# STELLINGEN

## behorende bij het proefschrift

### *Interactions of symplectic topology with singularity theory*

1. Two Lagrangian projective spaces in  $(X_3, \omega)$  can be made disjoint by a Hamiltonian isotopy if and only if the periods  $h, \mu_1, \mu_2, \mu_3$  of  $\omega$  satisfy the inequality

$$\mu_1 + \mu_2 + \mu_3 < h.$$

2. There exists a Lagrangian Klein bottle in  $(S^2 \times S^2, \sigma \oplus \lambda\sigma)$ , in the  $\mathbb{Z}/2$ -homology class  $[pt \times S^2]$ , if and only if

$$\lambda < 2.$$

3. Gromov non-squeezing holds for the rational homology balls  $B_{p,1}$ : There exists a symplectic embedding of the rational homology ball  $B_{p,1}(\alpha)$  into the rational homology cylinder  $C_{p,1}(1)$  if and only if

$$\alpha < 1.$$

4. The links of two quasihomogeneous  $cA_n$  singularities are contactomorphic if and only if their defining polynomials are, up to a possible change of coordinates, *smoothly deformation equivalent*.
5. In the absence of (reasonable) Floer theory, one may implement more topological methods, like specific surgeries, to understand the behavior of Lagrangians.
6. The theory of Almost Toric Fibrations offers one of the most robust ways to represent and study symplectic 4-manifolds and their Lagrangian or symplectic (singular) submanifolds.
7. A *birational geometry for Lagrangians*, meaning the study of how properties of a Lagrangian change after blowing up, will benefit symplectic geometry greatly, by creating deeper connections with algebraic geometry.
8. Most classical embedding problems in symplectic geometry can be generalized for pinwheels and their corresponding neighborhoods.
9. The line between *passion* and *self-exploitation* is a very thin one and academics must be more weary of that.

10. If academics do not want to be complicit in the horrors committed by the international war industry, the -U.N. recognized- genocide of the Palestinian people being only one of them, they should strive to keep their universities independent of research and funding related to militaristic purposes.

Nikolas Adaloglou  
Leiden, 10 October 2025