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### Géométrie symplectique (3MT2114)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
<b>Master en mathématiques</b>	<b>Cours: 4 ph</b>	Voir ci-dessous	6

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

#### Période d'enseignement:

- Semestre Automne

#### Equipe enseignante

Felix Schlenk et Johannes Haubscher

#### Contenu

Symplectic geometry is a geometry that arose from the geometrization of celestial mechanics, but nowadays is at the cross-road of many branches of mathematics: of virtually all geometries, low-dimensional topology, mathematical physics, PDEs, etc.

This geometry is hard to "feel", since in contrast to Riemannian geometry there are no local invariants. One way to learn something about this geometry is by making experiments that lead to numbers: Given a simple subset  $U$  of  $\mathbb{R}^{2n}$  such as finitely many balls, or an ellipsoid, what is the largest scaling  $\lambda U$  that symplectically embeds into a given symplectic manifold?

Answering such questions leads to unexpected connections with other fields, such as Diophantine equations, Markov numbers, isoperimetric problems in lattices, degenerations or almost toric fibration of the complex projective plane, etc.

The prerequisites for this course are minimal (a bachelor in Maths would do), but some knowledge in differential geometry is useful.

#### Forme de l'évaluation

Examen oral 30 minutes

#### Modalités de rattrapage

aucun

#### Documentation

Nous allons envoyer aux étudiants le livre de Schlenk "Symplectic embedding problems, old and new".

#### Pré-requis

Bachelor en mathématiques

#### Forme de l'enseignement

ex cathedra, à Berne au cadre CUSO: [https://math.cuso.ch/?id=2607&L=0&tx\\_displaycontroller\[showUid\]=6589](https://math.cuso.ch/?id=2607&L=0&tx_displaycontroller[showUid]=6589) , corrections d'exercices