



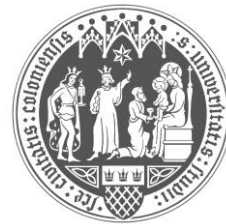
# Introduction to the Physics of Granular Matter

Matthias Sperl, Philip Born, Till Kranz



# Physics of Granular Matter

- Lecture: Tuesday 10am, download lecture, start 3rd Nov 2020
- Thursday 9:00-9:45am, online discussion time, student presentation; zoom <https://uni-koeln.zoom.us/j/99720799312> pwd: granular end 11th Feb 2021
- Credits for student presentation about topic from list of papers; your own suggestions possible but not necessary; preparation tutored by and iterated with M. Sperl; presentation online during Thursday slot
- Lecture 1st part: Ph. Born
- Lecture 2nd part: T. Kranz



# Physics of Granular Matter

Universität zu Köln KLIPS 2.0



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Suche

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## Suche Lehrveranstaltung

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Suchbegriff	<input type="text" value="GRANULAR"/>			<input type="button" value="Suchen"/>
Suchbereich	<input checked="" type="checkbox"/> LV-Nr	<input checked="" type="checkbox"/> Titel	<input checked="" type="checkbox"/> Lehrinhalt / Lehrziel	
	<input checked="" type="radio"/> Deutsch	<input type="radio"/> Englisch		
Studienjahr	<input type="text" value="2020/21"/>			
Semester	<input checked="" type="radio"/> alle <input type="radio"/> Winter <input type="radio"/> Sommer			
LV-Kategorie	<input type="text"/>			

Auswahl Bedienstete **Lehrveranstaltung** Organisationen Räume Studien

	LV-Nr	Zeit Ort	Titel	Dauer (SWS)	Art	Anm.	SPO P/W/Dr	Vortragende	betreut von
1	14756.2031	20W	Introduction to the Physics of Granular Matter	3	VU			Born P, Kranz W, Sperl M	MNF14756



# Physics of Granular Matter:

## <https://wtkranz.de/Granular2021/>



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## Introduction to the Physics of Granular Matter (WS 20/21)

[Prof. Dr. Matthias Sperl](#)

Dr. Philip Born

[Dr. Till Kranz](#)

### News

- The lecture will be online only
- Links to the recorded video lectures will be posted here
- In the Thursday time slot we will be available for questions and comments on Zoom (link to be provided shortly)
- There will be no tutorial but listeners interested in the credits for the course should give a seminar presentation.

### Course Description

Granular matter is an example for a physical system far from equilibrium: Dissipative collisions among the constituent particles break time reversal symmetry and a constant energy input is necessary to establish a non-equilibrium steady state. The course shall give an overview of the current understanding of the physics of granular materials comprising theory, computer simulation as well as laboratory and microgravity experiments. Beyond the current state of the art, open research questions shall be reviewed as well as implications for applications.

### Topics include

#### Granular Phenomena in Nature

Sand Piles; Avalanches; Formation and Migration of Dunes, etc.

#### Granular Packings

Mechanical Properties; Critical Behavior; Non-Destructive Techniques

#### Granular Fluids

Kinetic Theory; Rheology; Computer Simulation; Experiments in Microgravity