

## Hypersmart Matter, M. Serra Garcia (2017-2022)



Marc Serra Garcia was born on 27 April 1987 in Manresa, Spain. He did his master studies at Caltech (2011-2013), and PhD (2013-2017) at ETH Zurich, in the group of Prof. Chiara Daraio – focused on vibration energy conversion, followed by a postdoc in the group of Prof. Sebastian Huber -- investigating mechanical topological insulators, and two years of work as senior scientist in the group of Prof. Johan Robertsson, working on elastic wave problems arising in the context of geophysical exploration.

Since 2021, he leads the Hypersmart matter group at AMOLF. The group investigates information processing in mechanical systems, asking both fundamental questions (e.g. what is the minimum energy required to perform a computation? How do intelligent behaviours such as computing, memory or learning arise from physical building blocks such as nonlinearity, gain or nonreciprocity?), and application-driven questions (How can we build intelligent devices that do not require any power). In this context, Serra Garcia holds an ERC starting grant, aiming to build mechanical systems performing passive sparse event detection (e.g. a micromechanical system that can detect if a person says ‘OK Google’, or if a patient has atrial fibrillation, without consuming any standby power).

### Group output

#### Peer reviewed Publications 2017-2022

*The group of Serra Garcia started Nov. 2021. Only output to which he contributed as AMOLF PI is listed.*

N/A

#### **2022**

1. M. Serra-Garcia, *Topological properties that can be heard*, Nature Mater. **21**, (4), 385-386 (2022)

#### Contributions to scientific books (chapters or entire book) 2017-2022

N/A

#### PhD theses 2017-2022

N/A

#### Masters and Bachelors theses 2017-2022

N/A

## Invited lectures at international conferences and meetings

### 2022

1. M. Serra-Garcia, Metamaterials you can talk to: Binary classification of spoken words using elastic resonators, Euromech colloquium 610 “Emerging topics in acoustic and mechanical metamaterials”, Benicassim, Spain, 27/04/2022.
2. M. Serra-Garcia, Mechanical computing near the thermodynamic limit, NWO Physics (online), 26/01/2022.
3. M. Serra-Garcia, *Zero-power speech processing in passive elastic metastructures*, Euromech colloquium 616 “Unification of microsystems and metamaterials for new generation engineering solutions”, Milan, Italy, 11/10/2022.
4. M. Serra-Garcia, *Zero-power speech processing in passive elastic metastructures*, Wombat 2022 “Workshop in Optomechanics and Brillouin Scattering”, Erlangen, Germany, 14/6/2022.

## Academic Teaching 2017-2022

### 2022

1. M. Serra-Garcia (w/ Chris Slootweg, Mazi Jalal, Pim Linnebank), BSc Minor Biomimicry, University of Amsterdam, The Netherlands (30 ECTS course).

## Selected awards & recognitions 2017-2022

N/A

## Valorization 2017-2022

N/A