

# Plant Growth and Form

2nd International Symposium on Quantitative Plant Morphodynamics  
Organised by the DFG FOR2581

September 12th-15th 2022  
Heidelberg, Germany

Mechanics & patterning  
Modelling plant growth  
Evolution of plant form  
Quantifying cell and tissue growth

Arezki Boudaoud  
Bert de Rybel  
Pau Formosa-Jordan  
Anja Geitmann  
Christian Hardtke  
Daniel Kierzkowski  
Yasmine Meroz  
Alexis Peaucelle

Staffan Persson  
Sarah Robinson  
Adrienne Roeder  
Anne-Lise Routier  
Arun Sampathkumar  
René Schneider  
Kirsten ten Tuscher  
Joop Vermeer

[www.plantmorphodynamics.com](http://www.plantmorphodynamics.com)



Image: T. Atli Mocz and A. Vjayan, Schmelz Lab TU Munich



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DFG

## Program

### Monday September 12th

12:00 **Registration**

13:45 **Opening & Welcome**  
Alexis Maizel

#### Session 1 **Cell Wall & Cytoskeleton I** (chair: A. Maizel)

14:00 **Arun Sampathkumar** **O-01**  
*Max Planck Institute of Molecular Plant Physiology, Potsdam, Germany*  
Actin mediated avoidance of tri-cellular junctions influences global topology at the shoot apical meristem

14:30 **René Schneider** **O-02**  
*University of Potsdam, Potsdam-Golm, Germany*  
A novel phenotyping tool for secondary walls of proto- and meta-xylem

15:00 **Angela Hay** **O-03**  
*MPIPZ, Köln, Germany*  
Growth and tension in explosive fruit

15:30 Coffee break

16:00 **Alexis Peaucelle** **O-04**  
*INRAE IJPB, Versailles, France*  
Optical nanoscopy on the cell wall polymers brings to light a new plant growth model.

16:30 **Noemi Svolacchia** **O-05**  
*Sapienza University of Rome, Rome, Italy*  
Molecular mechanisms controlling the interdependency between cell expansion and cell differentiation

17:00 **Guido Grossmann** **O-06**  
*Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany*  
Robust yet flexible - morphogenesis and growth regulation in root hairs.

17:30 **Flash talks:**

1-Bertolotti	6-Fuchs	12-Palatnik
2-Bertran Garcia de Olalla	7-Harholt	13-Saini
3-Cullen	8-Hsia	14-Schreier
4-Dubois	9-Kraska	15-Serra
5-Emonet	10-Legland	16-Smithers
	11-McLaughlin	17-Tenorio Berrio
		18-Weissbart

18:00 Get together drinks

**Tuesday September 13th****Session 2 Growth, Patterning and Signalling I** (chair: T. Greb)

- 09:00 **Christian Hardtke**  
*University of Lausanne, Lausanne, Switzerland*  
Brassinosteroid signaling impact at single-cell resolution **O-07**
- 09:30 **Bert De Rybel**  
*VIB/Ghent University, Ghent, Belgium*  
Unraveling plant vascular development at single cell resolution **O-08**
- 10:00 **Tejasvinee Mody & Ratula Ray**  
*Technical University of Munich, Freising, Germany*  
Insights into the cellular basis of organ curvature using 3D digital ovules **O-09**
- 10:30 Coffee break
- 11:00 **Martina Cerise**  
*Max Planck Institute for Plant Breeding Research, Köln, Germany*  
The organization of the shoot apical meristem changes dynamically during floral transition **O-10**
- 11:30 **Marcel Piepers**  
*Centre for Organismal Studies, Heidelberg, Germany*  
Organ poles from start to finish in lateral root development **O-11**
- 12:00 **Miltos Tsiantis**  
*MPI for Plant Breeding Research, Cologne, Germany*  
The genetic basis for diversification of leaf form: from understanding to reconstructing **O-12**

12:30 Lunch

13:30 Poster Session

**Session 3 Analytics, Physics and Modelling I** (chair: M. Tsiantis)

- 15:00 **Kirsten ten Tusscher**  
*Utrecht University, Utrecht, Netherlands*  
Reverse engineering the earliest stages of lateral root formation **O-13**
- 15:30 **Mathias Höfler**  
*TU München, Garching, Germany*  
Radial growth and stress patterning of the plant stem **O-14**
- 16:00 **Soeren Strauss**  
*Max Planck Institute for Plant Breeding Research, Cologne, Germany*  
Investigating the role of cytokinin in the growth cessation in the **O-15**  
*Arabidopsis* root
- 16:30 Coffee break
- 17:00 **Yasmine Meroz**  
*Tel Aviv University, Tel Aviv, Israel*  
Plant Tropisms as a Window on Plant Computational Processes **O-16**
- 17:30 **Gabriella Mosca**  
*Max Planck Institute for Plant Breeding Reserch, Cologne, Germany*  
A multi-layer, strain-based model to explain cardamine exocarp **O-17**  
contractility
- 18:00 **Samira Ebrahimi**  
*University of Copenhagen, Copenhagen, Denmark*  
Nondestructive optical interferometric imaging to characterize **O-18**  
nanometric morphological changes and subcellular dynamics in plants
- 18:30 End of day. Dinner on your own

## Wednesday September 14th

### Session 4 Cell Wall & Cytoskeleton II (chair: A. Emonet)

09:00 **Staffan Persson**  
*Copenhagen University, 1871, Denmark*  
 Regulation of cell wall synthesis in land plants **O-19**

09:30 **Joop Vermeer**  
*University of Neuchâtel, Laboratory of Molecular and Cellular Biology, Neuchâtel, Switzerland*  
 Channelling organ growth via intercellular communication **O-20**

10:00 **Xiaomin Liu**  
*COS, Heidelberg, Germany*  
 Investigating the impact of mechanical stress on the division orientation of cambium stem cells **O-21**

10:30 Coffee break

11:00 **Anja Geitmann**  
*McGill University, Ste-Anne-de-Bellevue, Canada*  
 Hydraulic organ actuation in plants **O-22**

11:30 **Marcus Heisler**  
*University of Sydney, Sydney, Australia*  
 PIN-FORMED1 polarity in the shoot epidermis is insensitive to the polarity of neighbouring cells **O-23**

12:00 **Remko Offringa**  
*Plant Developmental Genetics, Institute of Biology, Leiden University, Leiden, Netherlands*  
 Touching PINOID: auxin and calcium-dependent regulation of phyllotaxis at the Arabidopsis inflorescence meristem **O-24**

12:30 Lunch

13:30 Poster Session

### Session 5 Growth, Patterning and Signalling II (chair: K. Schneitz)

15:00 **Adrienne Roeder**  
*Cornell University, Ithaca NY, United States*  
 The importance of timing in emergence of robust leaf and sepal size and shape **O-25**

- 15:30 **Pau Formosa-Jordan**  
*Max Planck Institute for Plant Breeding Research, Cologne, Germany*  
How does cellular patterning emerge in a growing tissue? The case of giant cells. **O-26**
- 16:00 **Sarah Robinson**  
*Sainsbury Laboratory Cambridge University, Cambridge, United Kingdom*  
How does cell division alter the mechanical properties of growing tissues? **O-27**
- 16:30 Coffee break
- 17:00 **Daniel Kierzkowski**  
*Institut de recherche en biologie végétale, University of Montreal, Montreal, Canada*  
Competing developmental gradients modulate organ shapes in plants **O-28**
- 17:30 **Martin Bayer**  
*ZMBP - University of Tübingen, Tübingen, Germany*  
How MAP kinase signaling shapes asymmetric cell divisions - a lesson from the plant embryo **O-29**
- 18:00 **Novella Guidi**  
*Life Science Alliance, EMBO Press, Heidelberg, Germany*  
Open Science and Publishing tips **O-30**
- 18:30 Dinner
- 20:00 Party

**Thursday September 15th****Session 6 Analytics, Physics and Modelling II** (chair: J. Lohmann)

- 09:00 **Anne-Lise Routier**  
*Université de Montréal, Montréal, Canada*  
Cell-type-specific dynamics underlies cellular growth variability in plants **O-31**
- 09:30 **Fred Hamprecht & Anna Kreshuk**  
*Heidelberg University, Heidelberg, Germany*  
Adventures in Segmentation and Dimension Reduction **O-32**
- 10:00 **Benedicte Charrier**  
*CNRS, Roscoff, France*  
Modeling the force-driven embryogenesis in the brown alga *Saccharina* **O-33**
- 10:30 Coffee break
- 11:00 **Isabella Østerlund**  
*University of Copenhagen, Frederiksberg C, Denmark*  
Robust spatiotemporal actin filament disentanglement using a network theoretic framework **O-34**
- 11:30 **Sylvia Rodrigues da Silveira**  
*University of Montréal, Montréal, Canada*  
Mechanical interactions between tissue layers underlie anther morphogenesis **O-35**

12:00 End