Maria Leptin

Talk title:

**Morphogenesis: from whole organism integration to biophysical principles**

Now that the highly successful reductionist approaches applied by developmental biologist over the last decades have nearly solved many of the genetic cascades from cell fate determination to the players in the cell that mediate the physical changes of morphogenesis, it is time for a more integrated understanding of development. Using gastrulation in Drosophila, we have on the one hand returned to a more encompassing view to determine how cell populations across the entire embryo cooperate during morphogenesis. Physical manipulations and force measurements are beginning to give us insights into the logic of the mechanical forces and interactions in the embryo. At the same time, we drive reductionism even further and to understand the behaviour of molecules and the forces they exert to affect cell shape. We have developed simulations and a theoretical model to study the role of the cytoskeleton and understand the rules by which it directs morphogenesis.