

# Nobel Laureate Lecture by Joachim Frank



Friday 23 June 2023 at 13:00-15:30

Per Kirkeby Auditorium, the Lakeside Lecture Theatres, Aarhus University

## “Looking at Molecules and their Dynamic Interactions in their Native, Functional States”

### Programme

- 13:00: Welcome by the Royal Danish Academy of Sciences and Letters
- 13:05: Welcome by Aarhus University
- 13:10: Nobel Laureate Lecture by Joachim Frank (60 min & 20 min for Q&A)
- 14:30: Short presentation by the Novo Nordisk Foundation
- 14:40: 'Finger-food' reception for all lecture guests
- 15:30: Reception ends

**Nobel Laureate in Chemistry (2017) Joachim Frank (Professor at Columbia University, New York, USA) will give a lecture on cryo-EM imaging of biological molecules – how these have been a result of three revolutions, which now makes it possible to have detailed 3D models, as well as how his research has laid the foundation for this development in the field.**

The abundance of high-resolution structural information on biological molecules in their native states that emerged in the past decade has been the result of three revolutions: in the first (“single-particle techniques”), the very concept of structure was generalized and freed from the necessity of crystallization; in the second (“cryo-EM”), a mode of sample preparation was invented that kept the molecule in its native, hydrated state; and in the third (“direct electron detection”), the sensitivity and resolution of image recording in the electron microscope was boosted by the invention of new cameras, bringing us the current level of spatial resolution in the range of 2-4 Angstrom. More recent developments are geared toward the recovery of information on the dynamics of molecules.

*Joachim Frank was born in 1940 and raised in post-war Germany. Discovering twisted copper wires and Bakelite panels in the rubble of ruins as a young boy gave him the first inspirations toward his later career choice, followed by “experiments” under the verandah of his parents’ house. As he later during his work toward a Ph.D. learned about electron microscopy and started digital image processing, an *idée fixe* took hold of his mind: the idea that structure determination of molecules should not require their arrangement in perfect order, as in crystals. To see this idea of “single particle reconstruction” blossom and develop into a new branch of structural biology has been a most gratifying experience in the past 50 years, and particularly the past decade.*

Read more about Joachim Frank’s research:

[Advances in the field of single-particle cryo-electron microscopy over the last decade](#)  
[Generalized single-particle cryo-EM – a historical perspective](#)

The lecture is no. 23 in the series of Royal Academy Nobel Lectures, which the Royal Academy of Sciences and Letters is arranging in collaboration with the Novo Nordisk Foundation.

**Registration:**

**23 May at 12 noon-23 June 2023 at 8:00**

