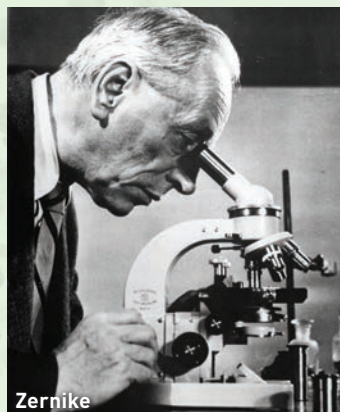
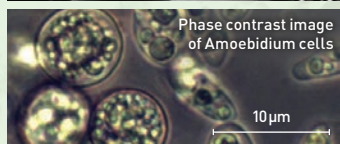


Microscopy & the Nobel

Here we look at the five Nobel Prizes awarded in the area of microscopy. For recent developments in super-resolution microscopy, see this month's cover story (p. 26).



Zernike

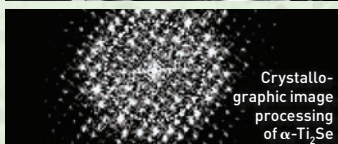


Phase contrast image of Amoebidium cells

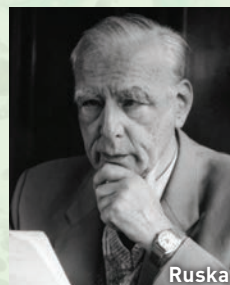
10 µm



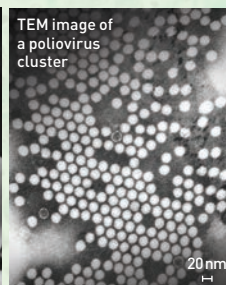
Klug



Crystallographic image processing of α -Ti₂Se

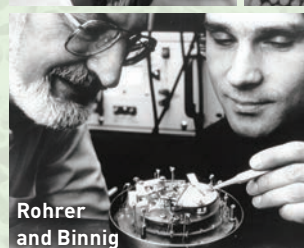


Ruska

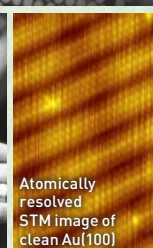


TEM image of a poliovirus cluster

20 nm



Rohrer and Binnig



Atomically resolved STM image of clean Au(100)

1953 NOBEL PRIZE IN PHYSICS

Frits Zernike "for his demonstration of the phase contrast method, especially for his invention of the **phase contrast microscope**"

1982 NOBEL PRIZE IN CHEMISTRY

Aaron Klug "for his development of **crystallographic electron microscopy** and his structural elucidation of biologically important nucleic acid-protein complexes"

1986 NOBEL PRIZE IN PHYSICS

One half awarded to **Ernst Ruska** "for his fundamental work in electron optics, and for the design of the **first electron microscope**" and one half awarded jointly to **Gerd Binnig** and **Heinrich Rohrer** "for their design of the **scanning tunneling microscope**"



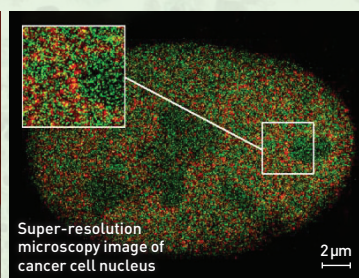
Betzig



Hell



Moerner



Super-resolution microscopy image of cancer cell nucleus

2 µm

2014 NOBEL PRIZE IN CHEMISTRY

Eric Betzig, Stefan W. Hell and William E. Moerner "for the development of **super-resolved fluorescence microscopy**"

2017 NOBEL PRIZE IN CHEMISTRY

Jacques Dubochet, Joachim Frank and Richard Henderson "for developing **cryo-electron microscopy** for the high-resolution structure determination of biomolecules in solution"



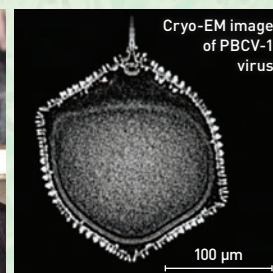
Dubochet



Frank



Henderson



Cryo-EM image of PBCV-1 virus

100 µm

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1953 Nobel Prize

Frits Zernike portrait: AIP Emilio Segrè Visual Archives, W.F. Meggers Gallery of Nobel Laureates Collection

Phase contrast image: H.Suga / Wikimedia Commons, CC BY 2.0

1982 Nobel Prize

Aaron Klug portrait: Dutch National Archives, The Hague / Wikimedia Commons, CC BY 3.0

Crystallographic image: T.E. Weirich / Wikimedia Commons

1986 Nobel Prize

Ernst Ruska portrait: M. Kischke, Fritz Haber Institut der Max Planck Gesellschaft, AIP Emilio Segrè Visual Archives, W.F. Meggers Gallery of Nobel Laureates Collection

TEM image: US Centers for Disease Control / Wikimedia Commons

Heinrich Rohrer and Gerd Binnig portrait: AIP Emilio Segrè Visual Archives, Physics Today Collection / Reprinted Courtesy of IBM Corporation

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2014 Nobel Prize

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2017 Nobel Prize

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