



# Multipolutveckling

## Föreläsning 8 – Elektromagnetism II

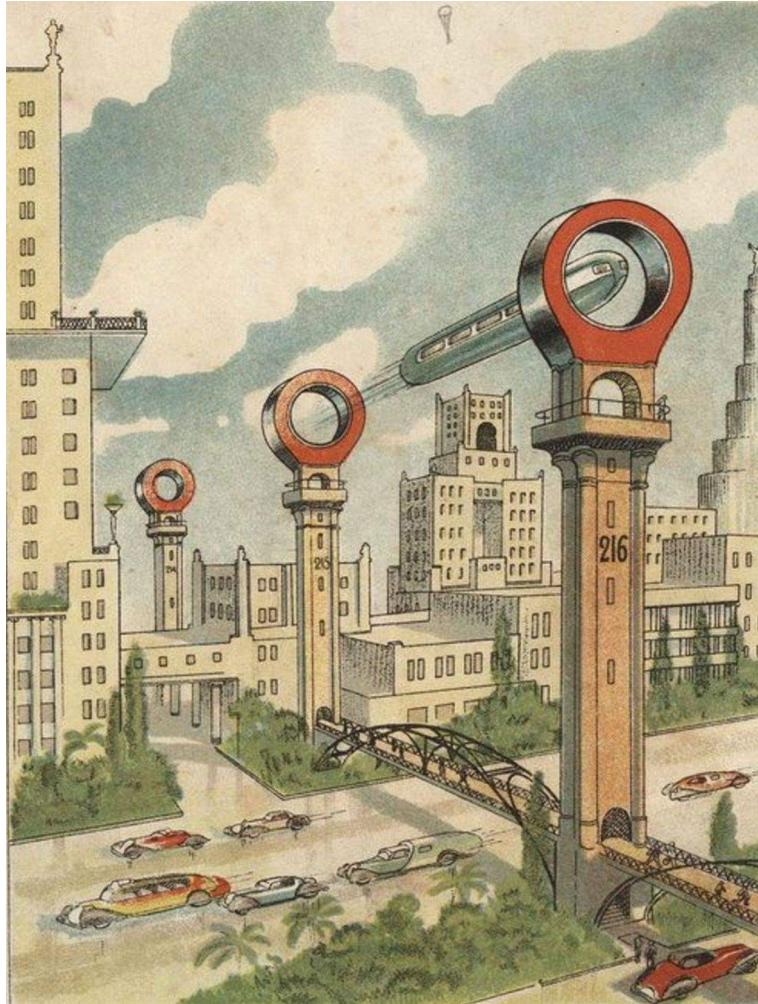
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Fredrik Jonsson

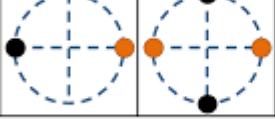
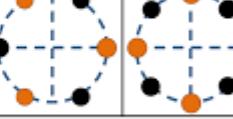
Uppsala University  
Division for Electricity  
Dept of Electrical Engineering

1TE626 (2025)

# Multipolutveckling



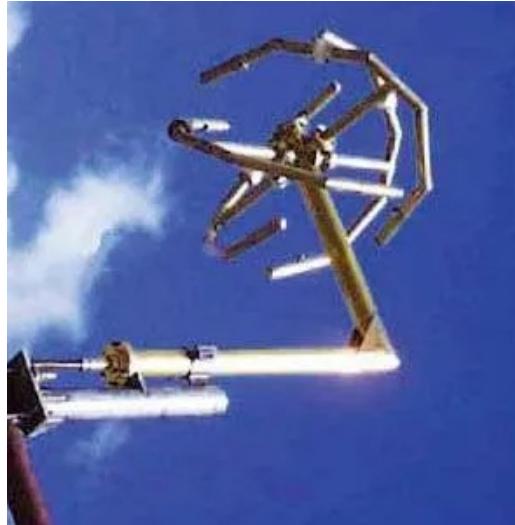
# Multipoler i praktiken

Lens	$2 \times 1$ -SYLC	$2 \times 2$ -SYLC	$2 \times 3$ -SYLC	$2 \times 4$ -SYLC
Multipole	Dipole	Quadrupole	Hexapole	Octupole
Layout				
Type	 ●			
Current	$+I_0$			

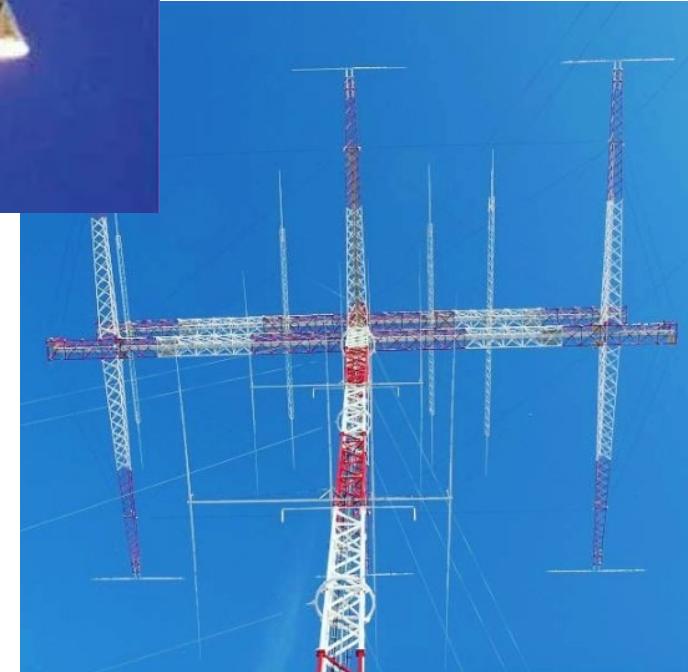
Linser för svepelektronmikroskop



Masspektrometrar

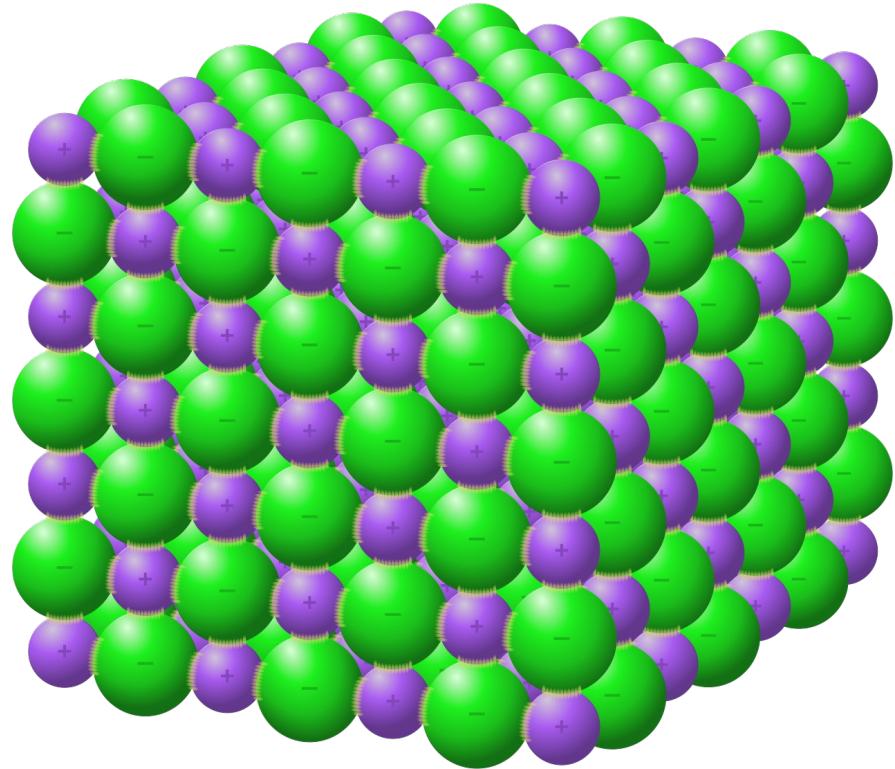
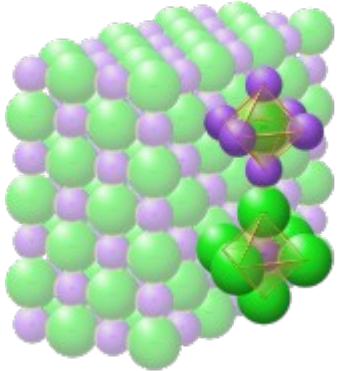


Antenner med  
skräddarsydda  
lober och  
polarisation

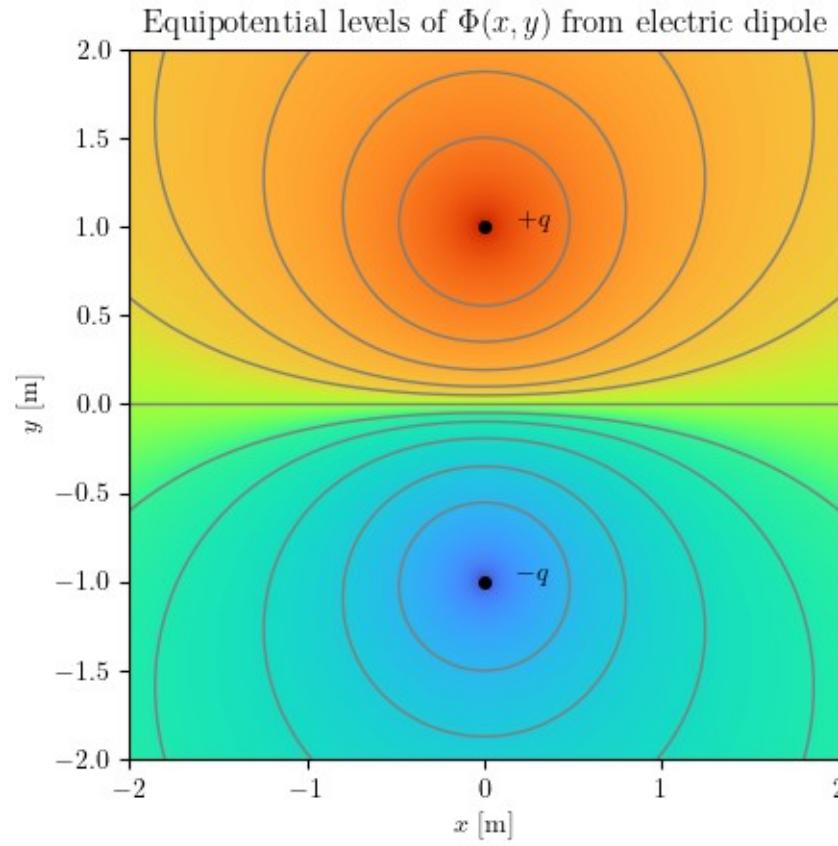


# Natriumklorid

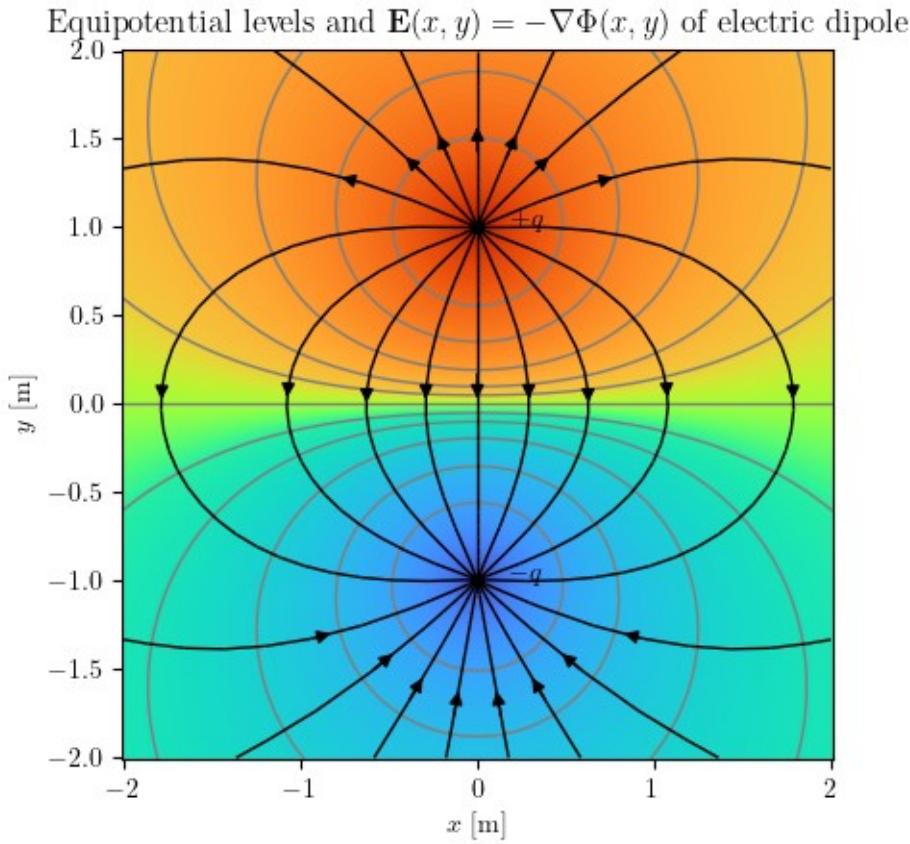
- Vanligt salt
- Face-centered cubic (FCC)
- Omväxlande gitterpositioner av  $\text{Na}^+$  och  $\text{Cl}^-$



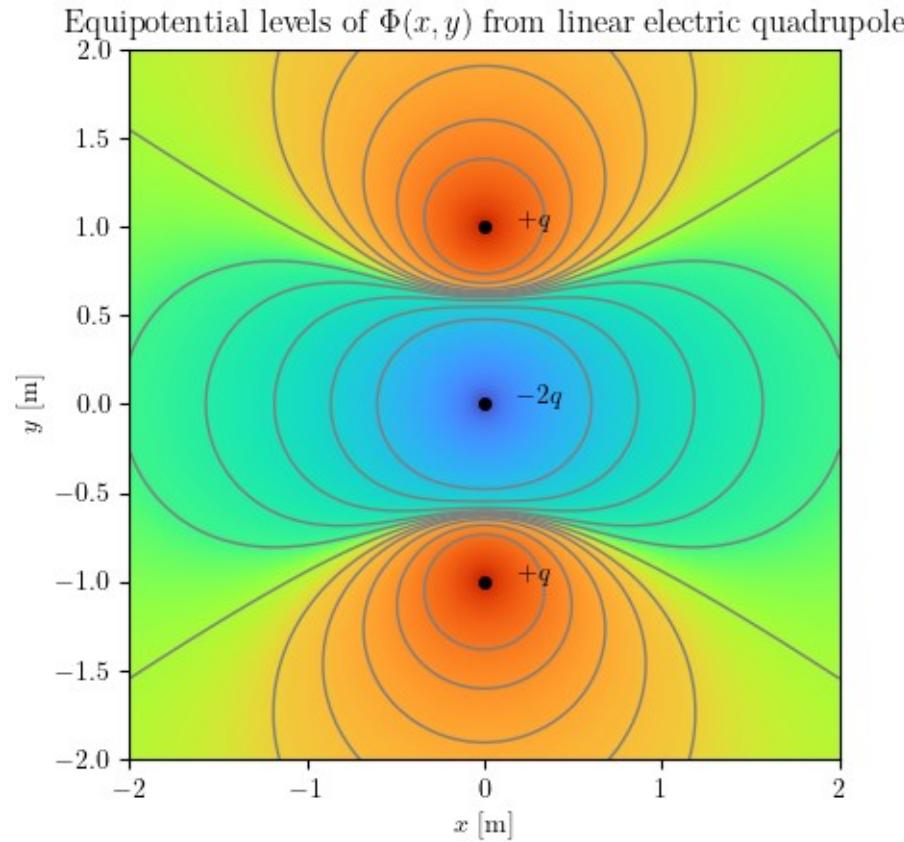
# Skalär potential från elektrisk dipol



# Elektriskt fält från elektrisk dipol

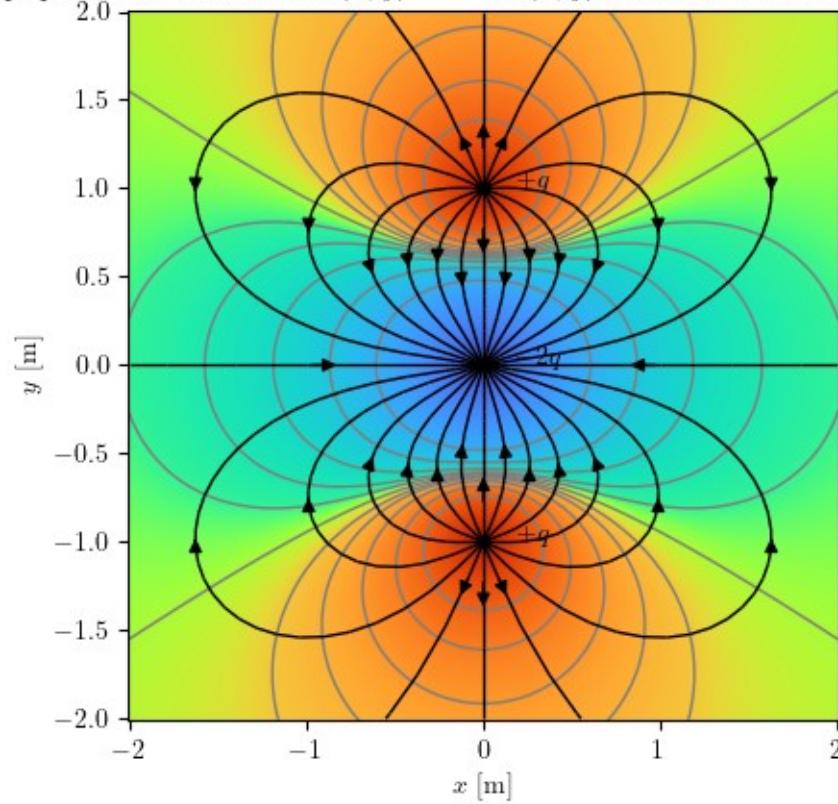


# Skalär potential från linjär elektrisk kvadrupol

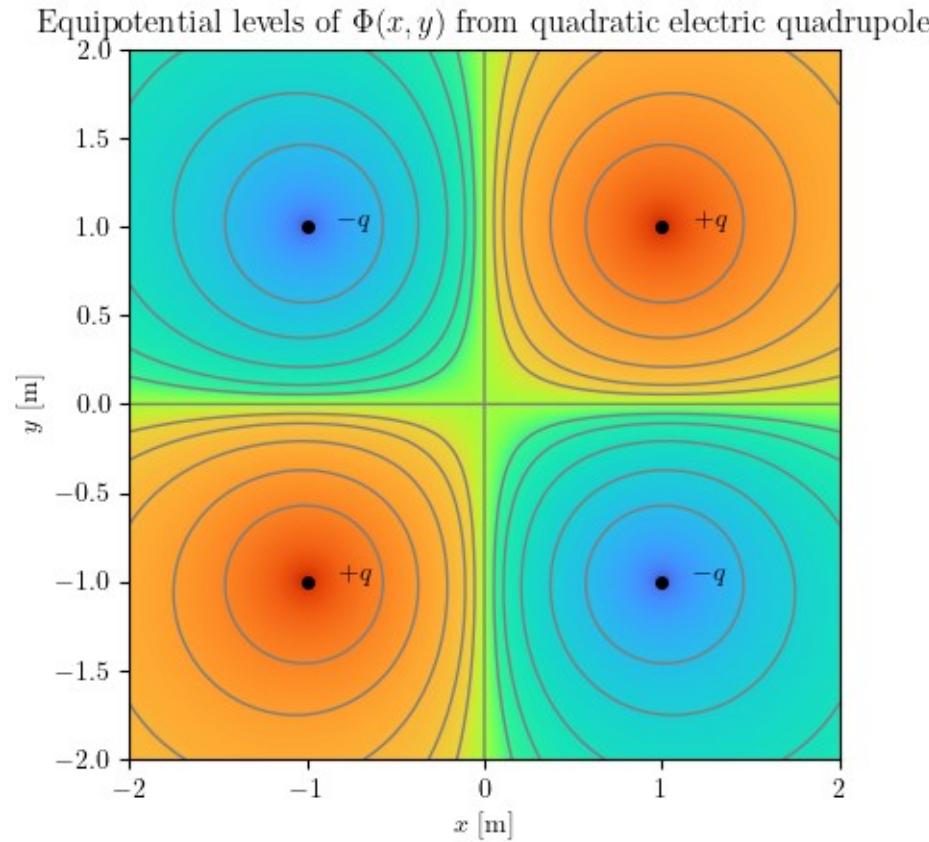


# Elektriskt fält från linjär elektrisk kvadrupol

Equipotential levels and  $\mathbf{E}(x, y) = -\nabla\Phi(x, y)$  of linear electric quadrupole



# Skalär potential från kvadratisk elektrisk kvadrupol



# Elektriskt fält från kvadratisk elektrisk kvadrupol

Equipotential levels and  $\mathbf{E}(x, y) = -\nabla\Phi(x, y)$  of quadratic electric quadrupole

