

## Paul Langevin

### Advanced

- ▶ Paul Langevin (1872 – 1946) was one of the fathers of magnetism.
  - In the "miracle year" 1905, when Einstein published three revolutionary papers, Langevin published his theory of para- and diamagnetism.
  - Considering that quantum theory had yet to be discovered, and that statistical thermodynamics was in its infancy, his contribution was of amazing insight.
  - As far as paramagnetism was concerned, he first established the treatment we used in the text for orientatio polarization (which is formally indenticl to paramagnetism).
- ▶ The resulting function of the form  $L(\mathbf{a}) = -1/\mathbf{a} + \mathbf{coth}(\mathbf{a})$  is therefore called teh Langevin functions (or sometime Langevin-Debye function, since Debye used the same procedure somewhat later for polar molecules).
- ▶ Langevin also worked in the field of Brownian motion (like Einstein). His work concerning ultrasonic sound during world war I was the base for sonar technology .