# CURRICULUM VITAE
# DAVID ROBERT NELSON

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Born: May 9, 1951
Birthplace: Stuttgart, Germany
Citizenship: U.S.

Married, three children

## EDUCATION

1. A.B., Cornell University, May 1972
   *Summa cum laude* in physics with Distinction in all subjects
   National Merit Scholar, Phi Kappa Phi, Phi Beta Kappa
   Cornell Six Year Ph.D. Program
2. M.S., Cornell University, May 1974
   Major subject: Theoretical Physics
3. Ph.D., Cornell University, January 1975
   Major subject: Theoretical Physics
   Thesis subject: Applications of the Renormalization Group to Critical Phenomena
   Supervisor: Michael E. Fisher

## EMPLOYMENT

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|---|---|---|
| 1. | Junior Fellow, Harvard Society of Fellows | 1975-78 |
| 2. | Associate Professor of Physics, Harvard University | 1978-80 |
| 3. | Professor of Physics, Harvard University | 1980-92 |
| 4. | Mallinckrodt Professor of Physics, Harvard University | 1992-2005 |
| 5. | Professor of Applied Physics, Harvard University | 1997- |
| 6. | Chair of Physics Department, Harvard University | 1997-2000 |
| 7. | Arthur K. Solomon Professor of Biophysics and Professor of Physics and Applied Physics | 2005- |
| 8. | Consulting with IBM T. J. Watson Research Laboratory, Exxon Research, Bell Laboratories and the Mitre Corporation | |

## HONORS

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| A.P. Sloan Fellowship | 1979-83 |
| MacArthur Prize Fellowship | 1984-89 |
| National Academy of Sciences Award for Initiatives in Research | 1986 |
| Guggenheim Fellowship | 1993-94 |
| Harvard Ledlie Prize | 1995 |
| Bardeen Prize (for research in superconductivity) | 2003 |
| Buckley Prize (for research on soft condensed matter) | 2004 |
| Welsh lectures, University of Toronto | 2001 |
| Mary Upson Visiting Professor, Cornell University, | 2004 |
| Mayent-Rothschild Visiting Professor Paris, Insitute Curie | 2005 |
| Sommerfeld Lecturer, Ludwig-Maxilliam University, Munich | 2006 |
| Lorentz Visiting Professor Leiden | 2006 |
| Mark Kac Memorial Lecturer, Los Alamos National Laboratory | 2007 |
| Primakoff Lecturer, University of Pennsylvania | 2007 |
| Kavli Lectureship, Delft University | 2010 |
| KITP Simons Distinguished Visiting Scholar | 2013 |
| Niels Bohr Medal of Honor, Copenhagen University | 2019 |

## SOCIETIES

Fellow, American Physical Society
American Association for the Advancement of Science
Elected to American Academy of Arts and Sciences, 1988
Senior Fellow, Harvard Society of Fellows, 1986-2003
Elected to National Academy of Sciences, 1994

## RESEARCH INTERESTS

- Collective effects in the physics, chemistry and materials science of condensed matter
- Interplay between fluctuations, geometry and statistical mechanics. In collaboration with his Harvard colleague, Bertrand I. Halperin, he is responsible for a theory of dislocation-mediated melting in two dimensions. The prediction of Halperin and Nelson of a fourth “hexatic” phase of matter, interposed between the usual solid and liquid phases, has now been confirmed in experiments on thin films and bulk liquid crystals.
- Research includes a theory of the structure and statistical mechanics of metallic glasses and investigations of “tethered surfaces,” which are two-dimensional generalizations of linear polymer chains. These fishnet-like structures exhibit a remarkable low temperature flat phase upon cooling.
- Flux line entanglement in high temperature superconductors. At high magnetic fields, thermal fluctuations cause regular arrays of flux lines to melt into a tangled spaghetti state. The physics of this melted flux liquid has important implications for many of the proposed applications of these new materials.
- Current interests include vortex physics, the statistical mechanics of polymers, topological defects on frozen topographies and biophysics problems such as the motion of biological motors along polynucleotide sequences and the unzipping of DNA and population genetics.
- Current biological interests include measuring selective advantages from sector angles with Saccharomyces cerevisiae, genetic drift and chirality at the frontier of range expansions of bacteria, viral spreading on inhomogeneous bacterial substrates, theory and experiments on mutualistic behavior of microorganisms at frontiers and dislocation-mediated remodeling of cell walls.