

## Nathan Newman

Lamonte H. Lawrence Professor in Solid State Science  
Arizona State University, Tempe, Arizona 85287-6106  
☎ (480)363-4940, Email: nathan.newman@asu.edu

### **Education:**

Ph. D. Electrical Engineering	Stanford University	June 1987
M.S. Electrical Engineering	Stanford University	June 1983
B.S. Biomedical/Electrical Engineering	University of Southern Calif.	Sept. 1981

### **Active Research interests**

Materials Science: Synthesis, characterization and modeling of novel photovoltaic material, novel superconductor junctions and materials, and low loss dielectrics for microwave communication.

### **Honors , Fellowships and Professional activities**

Lamonte H. Lawrence Professor in Solid State Science, 2009- 2022.  
Fellow, IEEE, 2013  
Fellow, American Physical Society, 2006  
Fellow, American Ceramic Society 2022  
Van Duzer award, IEEE, 2006  
Elected, National Academy of Inventors, 2020  
Elected, Member of EU (European Union) Academy of Sciences 2020  
Chair, U.S. Committee for Supercond. Electronics, 2012-2013.  
Member, Board of Directors, U.S. Committee for Supercond. Electronics, 2004-present.  
Honorary Professor, Amity University, Noida, India, 2018  
Distinguished teaching award, top 5% of teachers in the ASU engineering faculty, 2015  
Editor, IEEE Transactions of Applied Superconductivity 2008-present.  
Author or co-author of 210 articles in archival journals(172), books(6), technical magazines(5) & conference proceedings(27).  
8000+ citations and a Hirsch index of 45+  
Inventor or co-inventor of 13 U. S. Patents  
Editorial board, Journal of Superconductivity and novel magnetism, 2004-2008.  
Distinguished teaching award, Electrical Engin. Dept., Northwestern Univ., 1999.  
Founding Advisor, Sunrayce solar car undergrad project, Northwestern Univ., 1997-1999.  
Coach, 1998 and 1999 seasons and faculty advisor 1997 season, Northwestern Univ. Ice Hockey club team  
IBM Fellow, 1984-85, Varian Associates Fellow, 1983-84, summa cum laud, 1981

### **Professional Experience:**

*Emeritus Professor*, Professor of Materials, Arizona State University (ASU), 2022-present.  
*SciHub Director*, , Arizona State University (ASU), along with Professor Frank Wilczek, 2017-2026

*Professor*, Professor of Materials, Arizona State University (ASU), 3/00-2022; Director of the Center of Solid State Science, ASU, 7/06 – 6/2011; Chemical, Bio and Materials Engineering Dept., ASU 3/00 – 6/06, and Interim director of the Center for Solid-State Science, ASU, 7/04 – 6/06. Research focuses on the synthesis, characterization and modeling of novel photovoltaic materials, dilute magnetic semiconductors, superconductors for high field magnet applications, Josephson junctions for 100 GHz+ RSFQ digital logic applications, high-Q microwave dielectrics and ferroelectrics for energy storage applications.

*Assoc. Professor, Electrical and Computer Engineering Dept., Northwestern Univ.*, 3/96 – 2/00.  
Research focused on the synthesis, characterization and modeling of wide-bandgap photonic semiconductors, high-Q microwave dielectrics, tunable ferroelectrics and adhesion at interfaces.

Scientific Staff Level II, Energy and Environment Div., Lawrence Berkeley Labs, 3/92 to 3/93;  
Research Staff, Material Science Dept., University of California at Berkeley, 11/91 to 2/96.

Work focused on the development of a fundamental understanding of the thermodynamic and kinetic processes involved in meta-stable growth of GaN using Molecular Beam Epitaxy. The first spectroscopic study was performed which conclusively demonstrated the dominance of point defects (i.e. the  $As_{Ga}$ ) in the properties of annealed low-temperature GaAs. For the first time, experiments and local density calculations were used to unambiguously prove that Fermi-level pinning at metal/Group III-V semiconductor interfaces is dominated by interfacial defects. Responsible for managing the design & construction of the U. C. Berkeley Integrated Materials Laboratory, a new facility funded by the National Science Foundation for the growth and characterization of novel thin film structures and devices.

Member of the Technical Staff, Conductus, Inc., Sunnyvale, CA. 94086; 11/88 – 11/91.

Responsible for the growth and characterization of thin-epitaxial layers of high- $T_c$  superconducting films. Through this work, Conductus became one of the leaders in the production of  $YBa_2Cu_3O_{7-\delta}$  films with low-losses and low-noise at microwave frequencies. Responsible for growth of films using off-axis sputtering and for microwave loss measurements using a 11 GHz parallel-plate technique.

Research Assistant: EECS Dept., Stanford University; 1/83-5/87. Advisor: Prof. W. E. Spicer

Research Associate: EECS Dept., Stanford University; 5/87-5/88.

Scientific Staff, Level II: Lawrence Berkeley Labs; 5/87-5/88.

Experiments were initiated to test the possible correlation between the electrical characteristics of thick metal/group III-V Schottky barriers and the chemical and electronic properties of the interface. This work clearly demonstrated a correlation between the near-interfacial As:Ga stoichiometry and the barrier height of GaAs Schottky barriers. This work led to the development of the widely recognized Advanced Unified Defect Model of Fermi-level pinning at metal/Group III-V semiconductor interfaces.