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Foreword

Special issue in honor of Alex Pines

This issue of *Solid State Nuclear Magnetic Resonance* is a tribute to the impact our friend and mentor Alex Pines has had on the field of solid state NMR over the past 35 years. The immediate impetus for this issue is the fact that Alex reached his 60th birthday in 2005. No one expects this minor gerontological milestone to have any effect whatsoever on Alex's level of productivity, scientific or otherwise. Alex's 60th birthday is merely a convenient excuse to assemble a collection of research articles by his former students, postdocs, and associates that serves as a snapshot of the state-of-the-art in NMR methods, concepts, and applications, many of which derive directly from Alex's own work.

Alex Pines was born on June 22, 1945. He received his bachelor's degree from Hebrew University in 1967 and then came to the United States for graduate work at the Massachusetts Institute of Technology. At MIT, Alex joined the research group of John S. Waugh, which was in the midst of exploiting Waugh's new coherent averaging theory for inventing and analyzing multiple pulse sequences in NMR spectroscopy. Around that time, Waugh's group included Ulrich Haeberlen, Michael Mehring, Bob Griffin, and others who went on to become world leaders in various areas of magnetic resonance. But even in that illustrious group, Alex Pines' brilliance, creativity, and strength of personality stood out. After inventing cross-polarization, demonstrating time-reversal in dipole-coupled spin systems (with Rhim and Waugh), and developing the concept of second averaging at MIT, Alex moved to the University of California at Berkeley to establish his own research group in 1972. He has been on the Berkeley faculty ever since. Among the many advances in NMR spectroscopy that originated in Alex's laboratory, several of the most significant are the conceptual and experimental development of multiple quantum NMR, time-domain zero field NMR, iterative excitation schemes based on the fixed point theory, dynamic angle rotation and double rotation for high-resolution NMR of quadrupolar nuclei, SQUID-detected NMR, optically pumped xenon NMR for chemical and biochemical applications, and new approaches to ex situ NMR and magnetic resonance imaging.

Alex's laboratory at Berkeley has been the scientific home to more than 150 graduate students and postdocs. In preparation for this issue, I solicited contributions from approximately 50 of these people, plus several of Alex's close associates and collaborators. After only one reminder message, I received 35 positive responses. Twenty-seven manuscripts were actually submitted. Amazingly, all of these manuscripts were submitted within four weeks of the deadline I had set in the original solicitations. This unprecedented display of punctuality on the part of the authors is a clear sign of their enthusiasm for the idea of a special issue of *Solid State Nuclear Magnetic Resonance* in Alex's honor, and of the timeliness of this idea. (Ask anyone who has ever edited a special journal issue or a book of invited chapters!)

All contributions to this issue are original research articles, rather than reviews or restatements of previously published results. All manuscripts were fully peer-reviewed. I thank the reviewers for their careful reading of these manuscripts and their insightful comments. I thank the authors for taking the reviewers' comments seriously and making appropriate revisions.

And I thank Alex Pines for giving his assent to this project. This issue truly is a snapshot of the state-of-the-art. Topics include new mathematical analyses of the quantum mechanical evolution of coupled nuclear spin systems under applied fields, new techniques and critical tests of techniques for characterizing the structure and dynamics of inorganic, organic, and biological materials, novel combinations of solid state NMR with electron spin resonance and optical pumping, and applications of solid state NMR to systems that range from carbon nanotubes to prion proteins. Without Alex Pines' many conceptual and experimental innovations, would these applications be possible, and would solid state NMR be the intellectually vibrant field that it is today? I think not.

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