

# Contents

<i>ELECTRONS AND THEIR INTERACTIONS WITH ATOMS</i>	1
A Wave Theory of the Electron	5
<i>William Phelps Allis and Hans Müller</i> <i>J. Math. &amp; Phys. VI, 3, 119-132 (1927)</i>	
Theorie der Streuung langsamer Elektronen an Atomen	19
<i>W. P. Allis and P. M. Morse</i> <i>Z. Physik 70, 567-582 (1931)</i>	
The Effect of Exchange on the Scattering of Slow Electrons from Atoms	36
<i>Philip M. Morse and W. P. Allis</i> <i>Phys. Rev. 44, 269-276 (1933)</i>	
 <i>DIFFUSION AND MOBILITY</i>	 49
Theory of the Townsend Method of Measuring Electron Diffusion and Mobility	51
<i>W. P. Allis and Harriet W. Allen</i> <i>Phys. Rev. 52, 703-707 (1937)</i>	
Plasma Electron Drift in a Magnetic Field with a Velocity Distribu- tion Function	58
<i>Lewi Tonks and W. P. Allis</i> <i>Phys. Rev. 52, 710-713 (1937)</i>	

The Transition from Free to Ambipolar Diffusion	63
<i>W. P. Allis and D. J. Rose</i> <i>Phys. Rev. 93, 84-93 (1964)</i>	
On the Ambipolar Transition	89
<i>W. P. Allis</i> <i>M.I.T. Research Laboratory of Electronics Quarterly Progress Report No. 77,</i> <i>15 April 1965, p. 91</i>	
<b>MOTIONS OF ELECTRONS AND IONS</b>	<b>107</b>
Velocity Distributions for Elastically Colliding Electrons	109
<i>Philip M. Morse, W. P. Allis and E. S. Lamar</i> <i>Phys. Rev. 48, 412-419 (1935)</i>	
Plasma Theory	127
<i>W. P. Allis and S. J. Buchsbaum</i> "Plasma Dynamics Notes," A-1—E-40 (1959)	
<b>MICROWAVE DISCHARGES</b>	<b>223</b>
The Effect of Magnetic Field on the Breakdown of Gases at Microwave Frequencies	225
<i>Benjamin Lax, W. P. Allis, and Sanborn C. Brown</i> <i>J. Appl. Phys. 21, 1297-1304 (1950)</i>	
Electron Density Distribution in a High Frequency Discharge in the Presence of Plasma Resonance	242
<i>W. P. Allis, Sanborn C. Brown, and Edgar Everhart</i> <i>Phys. Rev. 84, 519-522 (1951)</i>	
High Frequency Electrical Breakdown of Gases	252
<i>W. P. Allis and Sanborn C. Brown</i> <i>Phys. Rev. 87, 419-424 (1952)</i>	

<b>WAVES AND OSCILLATIONS</b>	<b>265</b>
Electron Plasma Oscillations	269
<i>William P. Allis</i> <i>Proceedings of the Symposium on Electronic Waveguides, Polytechnic</i> <i>Institute of Brooklyn, 8-10 April 1958, p. 149</i>	
Propagation of Waves in a Plasma in a Magnetic Field	280
<i>William P. Allis</i> <i>IRE Transactions on Microwave Theory and Techniques MTT-9, 79 (January</i> <i>1961).</i>	
Notions Générales sur la Théorie Macroscopique des Ondes dans les Plasmas	290
<i>W. P. Allis and J. L. Delcroix</i> Presented as a seminar in the Laboratoire des Hautes Energies, University of Paris, September 1962	
Coupling Between Electromagnetic and Electron Waves in a Plasma	317
<i>W. P. Allis and S. J. Buchsbaum</i> <i>Nuclear Fusion 2 (1962), p. 49</i>	
<b>PLASMA PROPERTIES</b>	<b>331</b>
Diamagnetism of a Long Cylindrical Plasma	333
<i>W. P. Allis</i> Industrial Liaison Symposium "Plasma Physics," 24 April 1958	
The Relation Between the Transport and the Orbit Models for a Plasma	339
<i>S. Frankenthal and W. P. Allis</i> <i>IRE Transactions on Antennas and Propagation AP-10, 15 (January 1962).</i>	
Scattering Loss from Magnetic Mirror Systems—I	360
<i>D. J. BenDaniel and W. P. Allis</i> <i>Plasma Physics (Journal of Nuclear Energy Part C) 4, 31 (1962)</i>	
Scattering Loss from Magnetic Mirror Systems—II	399
<i>Plasma Physics (Journal of Nuclear Energy Part C) 4, 79 (1962)</i>	

*SPECIAL TYPE OF DISCHARGE* 417

## The Initial Avalanche in Discharge Counter Breakdown 419

*Sanborn C. Brown and W. P. Allis*Abstract of paper presented at the Washington, D.C., meeting of the American Physical Society, May 1-3, 1941; *Phys. Rev.* **59**, 932(A) (1941)

## A Theory of the Initial Avalanche in the Breakdown of a Discharge Counter in Helium 421

*Sanborn C. Brown*  
*Phys. Rev.* **62**, 244-254 (1942)*INDEX* 439