

IV MEXICAN MEETING ON  
MATHEMATICAL AND  
EXPERIMENTAL PHYSICS:  
RELATIVISTIC FLUIDS AND  
BIOLOGICAL PHYSICS

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Printed by Curran Associates, Inc. (2016)  
Print on Demand ISBN: (978-1-5108-1996-2)

To learn more about the AIP Conference Proceedings Series,  
Please visit **<http://proceedings.aip.org>**

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## CONTENTS

<b>Preface</b> .....	vii
<b>George H. Weiss Biography</b> .....	ix
<b>Leopoldo García-Colín Scherer Biography</b> .....	xv

### PART I

<b>Relativistic Fluids in Special and General Relativity</b> .....	3
G. M. Kremer	
<b>Relativistic Multi-Fluid Dynamics, Superfluids and Heat Conduction</b> .....	14
N. Andersson	
<b>Non-Newtonian Properties of Relativistic Fluids</b> .....	27
T. Koide	
<b>Foundation of Hydrodynamics for Systems with Strong Interactions</b> .....	39
C.-Y. Wong	
<b>Self-Gravitating Dissipative Sources in the “Fluidflow” Approach</b> .....	49
R. A. Sussman	
<b>Light Cone Analysis of Relativistic First-Order in the Gradients Hydrodynamics</b> .....	57
D. Brun-Battistini and A. Sandoval-Villalbaz	
<b>Relativistic Heat Conduction: The Kinetic Theory Approach and Comparison with Marle’s Model</b> .....	63
A. R. Méndez and A. L. García-Perciante	
<b>A Covariant Fokker-Planck Equation for a Simple Gas from Relativistic Kinetic Theory</b> .....	73
G. Chacón-Acosta, L. Dagdug, and H. A. Morales-Técotl	
<b>On the Balance Equations for a Dilute Binary Mixture in Special Relativity</b> . . .	80
V. Moratto, A. L. García-Perciante, and L. S. García-Colín	

### PART II

<b>A Brief History of the CTRW: Its Origin and Survey of Some Applications</b> . . .	91
G. H. Weiss and L. Dagdug	
<b>Mapping of Diffusion in Confined Systems (Beyond the Concept of Entropic Potential)</b> .....	102
P. Kalinay	
<b>Transition to Irreversibility in Sheared Suspensions</b> .....	114
I. Santamaría-Holek, G. Barrios, and J. M. Rubi	
<b>Assessing the Applicability of the Reduction to Effective One-Dimensional Description of Diffusion in a Hemispherical Shaped Tube</b> .....	124
M.-V. Vázquez and L. Dagdug	
<b>Bacterial Chemotaxis in Porous Media: Theory Derivation and Comparison with Experiments</b> .....	131
F. J. Valdés-Parada, M. L. Porter, and B. D. Wood	
<b>Author Index</b> .....	139