

Institute of Physics Publishing

# VII Mexican School on Gravitation and Mathematical Physics 2006

Journal of Physics: Conference Series Vol. 91

November 26 – December 2, 2006  
Quintana Roo, Mexico

Printed from e-media with permission by:

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571  
[www.proceedings.com](http://www.proceedings.com)

ISBN: 978-1-60560-252-3

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

Copyright (2006) by the Institute of Physics Publishing.

All rights reserved.

For permission requests, please contact the Institute of Physics Publishing at the address below.

Institute of Physics Publishing  
Dirac House, Temple Back  
Bristol BS1 6BE UK

**Tel** +44 (0)117 929 7481  
**Fax** +44 (0)117 929 4318

Institute of Physics Publishing  
VII Mexican School on Gravitation and Mathematical Physics  
2006

## TABLE OF CONTENTS

<b>Construction of Initial Data for 3+1 Numerical Relativity .....</b>	1
<i>Eric Gourgoulhon</i>	
<b>An Introduction to Relativistic Hydrodynamics.....</b>	29
<i>José A Font</i>	
<b>Scalar Fields: at the Threshold of Astrophysics .....</b>	54
<i>F S Guzmán</i>	
<b>The Initial Value Problem of Scalar-tensor Theories of Gravity.....</b>	66
<i>Marcelo Salgado, David Martínez-del Río</i>	
<b>Absorbing Boundary Conditions for Einstein's Field Equations.....</b>	80
<i>Olivier Sarbach</i>	
<b>A New Derivation of the Conformally Flat Stationary Cyclic Non-circular Spacetimes .....</b>	95
<i>Eloy Ayón-Beato, Cuauhtemoc Campuzano, Alberto García</i>	
<b>Flat Rotation Curves Using Scalar-tensor Theories.....</b>	100
<i>Jorge L Cervantes-Cota, M A Rodríguez-Meza, Dario Nuñez</i>	
<b>Dynamics of Born-Infeld Membranes .....</b>	104
<i>R Cordero, A Molgado, E Rojas</i>	
<b>The Modified Bargmann-Wigner Formalism for Bosons of Spin 1, 2 .....</b>	108
<i>Valeri V Dvoeglazov</i>	
<b>Noncommutative Black Holes .....</b>	113
<i>J C López-Domínguez, O Obregón, C Ramírez, M Sabido</i>	
<b>The Poynting Vector of a Charged Magnetic Dipole: Two Limiting Cases .....</b>	118
<i>J Sod-Hoffs, V S Manko</i>	
<b>Cosmological Simulations Using a Static Scalar-tensor Theory .....</b>	123
<i>M A Rodríguez-Meza, A X González-Morales, R F Gabbasov, Jorge L Cervantes-Cota</i>	
<b>Alternative Hamiltonian Representation for Gravity .....</b>	129
<i>R Rosas-Rodríguez</i>	
<b>Alternative Interpretation for the Moduli Fields of String Theories .....</b>	134
<i>Tonatiuh Matos, José-Rubén Luévano, L Arturo Ureña-López, J Alberto Vázquez</i>	
<b>Author Index</b>	