

MG16 5-10 JULY 2021

SIXTEENTH MARCEL GROSSMANN MEETING

ON RECENT DEVELOPMENTS IN THEORETICAL AND EXPERIMENTAL GENERAL RELATIVITY, ASTROPHYSICS AND RELATIVISTIC FIELD THEORIES

CELEBRATING THE 50TH ANNIVERSARY OF
 "INTRODUCING THE BLACK HOLE" AND
 THE BLACK HOLE MASS ENERGY FORMULA



VIRTUAL MEETING

websites:

<http://www.icra.it/mg/mg16/>
<https://indico.icranet.org/event/1/>

email:

mg16@icranet.org

6:30-19:30 CENTRAL EUROPEAN SUMMER TIME

INTERNATIONAL COORDINATING COMMITTEE

ALBANIA: Hafizi M. - **ARGENTINA:** Arguelles C., Scoccola C., Reula O., Romero G.E. - **ARMENIA:** Sahakyan N. - **AUSTRALIA:** Blair D., Ju L., Lun A., Manchester D., Melatos A., Quinn P., Scott S.M., Steele J.D. - **AUSTRIA:** Aichelburg P.C., Schindler S. - **BELARUS:** Kilin S., Prakapenia M., Siutsou I. - **BELGIUM:** Henneaux M. - **BOLIVIA:** Aguirre C.B. - **BOSNIA:** Pasic V. - **BRAZIL:** Barres de Almeida U., Coelho Goulart J., Dalmolin F.T., de Lima Rafael C.R., Guzzo M., Maia C., Malheiro M., Romero Filho C.A., Shellard R.C., Zen Vasconcelos C. - **BULGARIA:** Yazadjiev S. - **CANADA:** Singh D., Smolin L., Turok N. - **CHILE:** Bauer F., Bunster W.C., Giacomini A. - **CHINA (MAINLAND):** Cai R., Cai Y., Cao Z., Chang J., Chen J., Chen X., Dai Z., Feng L.-L., Han W., Jing Y., Li T.-P., Lin W., Lou Y.-Q., Luo J., Mei J., Tam T., Wang A., Wang Y., Wu X.-P., Wu Y.-L., Yuan Y.-F., Zhang B.-B., Zhang S.-N., Zhao G. - **CHINA (TAIWAN):** Chen Chiang-Mei, Chen Pisin, Lee Da-Shin, Lee Wo-Lung, Ni Wei-Tou - **COLOMBIA:** Bagueño de Retes P., Gonzalez G., Higuera Garzon M.A., Núñez L., Romano A.E., Valenzuela Toledo C.A., Zuluaga J.I. - **CROATIA:** Dominis Prester D., Karlica M., Milekovic M., Smolic V., Smolic I., Suric T. - **CUBA:** Perez Martinez A., Pérez Rojas H. - **CZECH REPUBLIC:** Bicak J., Stuchlik Z. - **DENMARK:** Naselsky P. - **ECUADOR:** Contreras E. - **EGYPT:** Tawfik A.N., Wanas M.I. - **ESTONIA:** Einasto J., Saar E. - **FINLAND:** Poutanen J., Volovik G. - **FRANCE:** Brillat A., Buchert T., Chardonnet P., Couillet P., de Freitas Pacheco J.A., Deruelle N., Iliopoulos J., Lamanna G., Mignard F. - **GEORGIA:** Lavrelashvili George, Machabeli Giorgi - **GERMANY:** Biermann P., Blumlein J., Di Piazza A., Fritzsche H., Genzel R., Gilmozzi R., Hasinger G., Hehl F., Keitel C., Kiefer C., Mirzoyan R., Neugebauer G., Nicolai H., Renn J., Ringwald A., Ruediger A. - **GREECE:** Batakis N.A., Cotsakis S., Vagenas E.C. - **HUNGARY:** Fodor G., Levai P. - **ICELAND:** Björnsson G., Jakobsson P. - **INDIA:** Chakrabarti S.K., Iyer B., Padmanabhan T., Souradeep T. - **IRAN:** Baghrani S., Bavarsad E., Eslam Panah B., Firouzjahi H., Haghightat M., Mansouri R., Mashhoon B., Shakeri S., Sobouti Y., Taghi Mirtorabi M. - **IRELAND:** O'Murchada N. - **ISRAEL:** Milgrom M., Nakar E., Pe'er A., Piran T. - **ITALY:** Belinski V., Bianchi M., Bianco C.L., Cherubini C., Della Valle M., Falciano S., Filippi S., Haardt F., Menotti

P., Merafina M., Pani P., Ricci F., Treves A., Vereshchagin G.V., Vitale S., Xue S.-S. - **JAPAN:** Fujimoto M.-K., Makishima K., Nakamura T., Sato K., Shibata M. - **KAZAKHSTAN:** Abishev M., Aimuratov Y., Boshkayev K., Mychelkin E.G., Spitaleri C. - **KOREA (PYEONGYANG):** Kim J.S. - **KOREA (SEOUL):** Kim S.P., Kim S.-W., Lee H.K., Lee H.-W., van Putten M. - **KYRGYZSTAN:** Gurovich V.Ts. - **LIBYA:** Gadri M. - **MEXICO:** Breton N., Cervantes-Cota J.-L., Fraija Cabrera N.I., García-Díaz A.A., Macías Alvarez A., Mielke Eckehard W., Quevedo H., Rodriguez L.F. - **NETHERLANDS:** Slagter R. - **NEW ZEALAND:** Visser M., Wiltshire D. - **NORWAY:** Elgarøy O., Fonseca Mota D., Knutsen H. - **PAKISTAN:** Qadir A., Qamar S. - **PERU:** Vargas T. - **POLAND:** Belczynski K., Demianski M., Lewandowski J., Nurrowski P., Sokolowski L. - **PORTUGAL:** Costa M., Da Silva A., Lemos J.P.S., Lobo F., Moniz P., Silva L.O. - **ROMANIA:** Visinescu M. - **RUSSIA:** Aksenov A., Arkhangel'skaja I., Bisnovatyj-Kogan G., Blinnikov S., Chechetikin V.M., Cherepaschuk A.M., Khriplovich I., Lipunov V.M., Lukash V.N., Novikov I., Rudenko V.N., Starobinsky A.A. - **SERBIA:** Djordjevic G., Jovanovic P., Knezevic Z., Pankov-Hzvojevic M., Popovic L., Prodanovic T., Sijacki D., Simic S. - **SLOVAKIA:** Balek V. - **SLOVENIA:** Cadez A., Gomboc A., Zavrtanek D. - **SOUTH AFRICA:** Larena J., Maharaj S. - **SPAIN:** Elizalde E., Ibanez J., Perez M.J., Verdaguer E. - **SWEDEN:** Abramowicz M.A., Marklund M., Ryde F. - **SWITZERLAND:** Durrer R., Jetzer P. - **TURKEY:** Aliev A., Gurses M. - **UKRAINE:** Novosyadlyj B., Zaslavskii O., Zhuk A. - **UNITED ARAB EMIRATES:** Fernini I. - **UNITED KINGDOM:** Cruise A.M., Frenk Carlos S., Green M., Mavromatos N., Perry M., Willingale R. - **USA:** Abel T., Ashtekar A., Bardeen J., Carlstrom J., Cornish N., Dermer C., Fan X., Flanagan E., Fraschetti F., Fryer C., Incera V., Jantzen R.T. (chairperson), Kolb R., Laguna P., Lousto C., Madau Piero, Mathews Grant, Matzner Richard, Melia Fulvio, Mester John, Michelson Peter, Nordtvedt Kenneth, Parker Leonard, Pretorius F., Pullin J., Shapiro I., Shapiro S., Shoemaker D., Smoot G., Stiavelli M., Teukolsky S., van Nieuwenhuizen P., Zhang B. - **UZBEKISTAN:** Ahmedov B., Zalaletdinov R.M. - **VATICAN CITY:** Gionti G. - **VENEZUELA:** Fuenmayor E. - **VIETNAM:** Long H.N.

Excerpt from the walls of ICRA room 301 in Sapienza

This is ICRA seat

Roy P. Kerr
 XIX VII F.R.S.
 President of ICRA XIX
 ICANET PROF.

Rich Boyle
 Specola Vaticana
 we appreciate your being connected
 Ajay - Dargatzis

S. Chandrasekhar
 Scattering by black-holes
 & 5 tons of collisionless
 waves from Gray Stacks
 1991 Sept 10

The Black Hole
 QUANTUM

$E = \hbar \omega$ $\omega_{eff} = \left(\frac{m_0 c^2}{m_{eff}} \right) \left(\frac{\omega_0}{\gamma} \right) \left(\frac{B_0}{B_{eff}} \right) \omega_0$
 XIX VII XIX

17 * 8 月 20 日 此 遊
 2004.7.5

Glad to have found occasion
 here to work with my intrinsic
 computer

Seppel Holperm
 22 VIII 91

Nm e' il piacere
 e' il amore!!
 Claudio Teitelbaum
 Marzo 29, 1999

David Arnett
 Summary Baseline
 in Turbulent Stars

Chris Fryer
 Hypercritical
 Accretion
 8/15/14

EU FERRARI
 NEAR ZERO

Questa baracca
 era e' mia! (1946)
 Ute Picoiani
 11-7-89

John Wheeler
 12X89

Andra Gault
 27/9/2001

W. John of
 c. HANNOVER
 not end of world
 19.04.88

Michael Kerr
 5.6.2007

The universe is so
 small, ICRA is
 everywhere

THE MARCEL GROSSMAN MEETINGS

Since 1975, the Marcel Grossman Meetings have been organized in order to provide opportunities for discussing recent advances in gravitation, general relativity and relativistic field theories, emphasizing mathematical foundations, physical predictions and experimental tests. The objective of these meetings is to elicit exchange among scientists that may deepen our understanding of space-time structures as well as to review the status of ongoing experiments aimed at testing Einstein's theory of gravitation and relativistic field theories either from the ground or from space. Previous meetings have been held in Trieste (1975) and (1979), Shanghai (1982), Rome (1985), Perth (1988), Kyoto (1991), Stanford (1994), Jerusalem (1997), Rome (2000), Rio (2003), Berlin (2006), Paris (2009), Stockholm (2012) and Rome (2015-2018). Interested scientists should address a member from any one of the organizing committees or the conference secretariat.

INTERNATIONAL ORGANIZING COMMITTEE

Blair D., Choquet Bruhat Y., Damour T., De Bernardis P., Everitt C.W.F., Fryer C., Haensch T., Henneaux M., Jones C., Kerr R., Kleinert H., Kunz J., Laemmerzahl C., Longair M., Mirabel F., Mirzoyan R., Piran T., Rueda J., Ruffini R. (chairperson), Sasaki M., Sato H., Sunyaev R., 't Hooft G., Weinberg S., Yau S.-T., Zhang B.

LOCAL ORGANIZING COMMITTEE

Adamo C., Bianco C.L., Brandolini G.A., di Niccolo C., Latorre S., La Selva D., Li L., Loppini A., Natale E., Verzulli D., Vereshchagin G.V. (chairperson), Wang Y.

