

Proceedings of the annual meeting of the French Society of Astronomy & Astrophysics

Montpellier, June 4-7, 2013

LUPM
LABORATOIRE MONTPELLIER
UNIVERS & PARTICULES

SF2A
SOCIÉTÉ FRANÇAISE
D'ASTRONOMIE &
D'ASTROPHYSIQUE

Semaine de l'Astrophysique

du 4 juin au 7 juin 2013 www.sf2a.eu

Montpellier
Faculté de Médecine

Journées de la SF2A

Journées communes avec la NAC
(Nederlandse Astronomisch Club),
Société d'Astronomie des Pays-Bas

Sessions plénières

Ateliers SF2A - SFE - PNHE - PCMI - PNCQ -
PNP - PNPS - PNST - AaA - ASA - AS HRA - AS
GAIA - AS GRAM - AS SKA-LOFAR - AS BV

Evénements

Prix Jeune Chercheur
SF2A/AMD/NIP

Prix scolaire "Découvrir l'Univers"
SF2A/FDP

Prix de thèse
SF2A/FDP

Conférence grand public

LOC

A. Palacios (co-Chair INSU)
E. Nuss (co-Chair IN2P3)
K. Amati
S. Catala
Y. Gallant
I. Josselin
A. Lebrun
A. Marcewicz
E. Martínez
C. Morrisson
F. Piran
B. Plez
D. Prévot
D. Prévot
M. Renaud
D. Talbi

SGC

C. Bevilacqua (Chair, présidence SF2A)
H. Wozniak (vice-président SF2A)
D. Burgarella (vice-président UAI-SF2A)
E. Martínez
M. Delouis
S. Delisle
J. Ballet
S. Bata
L. Cambrésy
C. Charbonnel
H. Wozniak
D. Prévot

UMR CNRS CEA A-Mixte Laser COCOT M

hp AMD Intel

Credit: Christophe Mercier

Table of contents	i
Foreword	ix
List of participants	xi
SF2A - Session plénière (S00)	1
Gaia, counting down to launch <i>Anthony G.A. Brown</i>	3
Bibliography of French Astrophysics in 2012 <i>D. Egret</i>	9
Interstellar magnetic fields <i>Katia Ferrière</i>	13
Probing the outer solar system small bodies with stellar occultations <i>L. Maquet, F. Roques, A. Doressoundiram, C.-Y. Liu, H.-K. Chang, S. I. Chun, and Miosotys Team</i>	19
La Section 17 du Comité National de la Recherche Scientifique <i>M. Marcellin</i>	23
Red giants seismology <i>B. Mosser, R. Samadi, and K. Belkacem</i>	25
A New Generation of Infrared Sky Survey for the E-ELT era <i>I. Vauglin, M. Langlois, G. Moretto, N. Epchtein, E. Aristidi, M. Carbillet, and L. Abe</i>	37
Cassini: révolutions autour de Saturne (S01)	41
Impact of tidal inertial waves damping on orbital dynamics <i>P. Auclair-Desrotour, C. Le Poncin-Lafitte, and S. Mathis</i>	43
Saturn's rings observed by the Cassini spacecraft (I.S.S.) <i>André Brahic</i>	47
SATELLITE FORMATION :spreading of rings beyond the <i>Roche</i> radius <i>A. Crida, and S. Charnoz</i>	57
Saturn's stratospheric temperature and composition from Cassini/CIRS <i>S. Guerlet, T. Fouchet, B. Bézard, A. Spiga, M. Sylvestre, J. Moses, and F.M. Flasar</i>	61
Science goals and concepts of a Saturn probe for the future L2/L3 ESA call <i>F.-X. Schmider, O. Mousis, L. N. Fletcher, K. Altwegg, N. André, M. Blanc, A. Coustenis, D. Gautier, W. D. Geppert, T. Guillot, et al.</i>	65
Six years of continuous observation of Titan cloud activity with Cassini/VIMS <i>S. Rodriguez, S. Le Mouélic, P. Rannou, C. Sotin, and R.H. Brown</i>	71
Modélisation numérique en physique stellaire (S03)	75

3D simulations of internal gravity waves in solar-like stars <i>L. Alvan, A.-S. Brun, and S. Mathis</i>	77
Effect of internal gravity waves on the transport of angular momentum during the PMS <i>T. Decressin, C. Charbonnel, L. Amard, A. Palacios, and S. Talon</i>	81
Angular momentum evolution model for solar-like stars <i>Florian Gallet</i>	85
Spectroscopic and asteroseismic diagnostics on mixing processes inside red giant stars <i>N. Lagarde</i>	91
Local direct numerical simulations of turbulent mixing in stellar radiative zones <i>V. Prat, and F. Lignières</i>	97
Present status of two-dimensional ESTER models: Application to Be stars <i>M. Rieutord, and F. Espinosa Lara</i>	101
The stellar opacities <i>S. Turck-Chièze, D. Gilles, F. Gilleron, J.C. Pain, and the international OPAC consortium</i>	105
Fully-compressible hydrodynamical simulations of turbulent convection <i>M. Viallet</i>	111
Gaia : Quelles perspectives pour la physique stellaire ? (S05)	113
Towards a better understanding of multiple populations in globular clusters <i>W. Chantereau, C. Charbonnel, T. Decressin, and G. Meynet</i>	115
Non-LTE Iron abundance determination of a sample of Kepler Red Giants <i>Rana Ezzeddine, Thibault Merle, and Bertrand Plez</i>	119
Mapping the interstellar Galactic extinction: a model-independent way. <i>C. Fournelle-Ravard, C. Babusiaux, and A. Gómez</i>	123
Improved SB2 orbits for HIP 12081 and HIP 87895 <i>J.-L. Halbwachs, F. Arenou, P. Guillout, D. Pourbaix, L. Tal-Or, B. Famaey, Y. Lebreton, and T. Mazeh</i>	127
Kinematic versus Spectroscopic Radial Velocities for the Gaia RVS <i>G. Jasniewicz, F. Thévenin, A. Chiavassa, L. Bigot, L. Chemin, F. Crifo, D. Hestroffer, D. Katz, P. Sartoretti, C. Soubiran, et al.</i>	137
Model atmospheres and fundamental stellar parameters <i>B. Plez</i>	141
Stellar parameters and stellar physics from Gaia and related spectroscopic surveys <i>Alejandra Recio-Blanco</i>	147
Astrométrie de haute précision et applications (S06)	153
Relativistic models for Gaia at the (cross)check-point <i>S. Bertone, C. Le Poncin-Lafitte, M. Crosta, A. Vecchiato, O. Minazzoli, and M.-C. Angonin</i>	155
Radio source structure and VLBI position instabilities <i>R. Bouffet, P. Charlot, and S. Lambert</i>	161

Orbit determination methods in view of the PODET project <i>F. Deleflie, D. Coulot, R. Decosta, and P. Richard</i>	165
High Precision Astrometry in Asteroid Mitigation - the NEOShield perspective <i>S. Ettl, A. Ivantsov, D. Hestroffer, D. Perna, D. Bancelin, and W. Thuillot</i>	169
Software tools for the validation of the in-flight calibration performance of the MICROSCOPE space mission <i>E. Hardy, A. Levy, M. Rodrigues, P. Touboul, and G. Métris</i>	177
PôDET: A Centre for Earth Dynamical Environment <i>D. Hestroffer, and F. Deleflie</i>	183
Markov Chain Monte-Carlo Orbit Computation for Binary Asteroids <i>Dagmara Oszkiewicz, Daniel Hestroffer, Pedro David, C.</i>	189
Stochastic perturbation of the two-body problem <i>J. Cresson, F. Pierret, and B. Puig</i>	195
Resonances due to third body perturbations in the dynamics of MEOs <i>L. Stefanelli, and G. Metris</i>	205
Atelier général du PNPS (S08)	211
Laser experiment to study radiative shocks relevant to astrophysics. <i>U. Chaulagain, C. Stehlé, J. Larour, M. Kozlová, P. Barroso, L. de Sá, F. Suzuki-Vidal, O. Acef, P. Auvray, M. Krüs, et al.</i>	213
First unbiased spectral survey of a young and single massive protostar: CygX-N63 <i>S. Fechtenbaum, and S. Bontemps</i>	219
Towards 3D simulations of Cepheids stars <i>S. Félix, E. Audit, and B. Dintrans</i>	223
Impact of a major merger in the Local Group <i>S. Fouquet, F. Hammer, Y. Yang, M. Puech, and H. Flores</i>	227
The X-shooter Spectral Library and Carbon stars <i>A. Gonneau, A. Lançon, S. C. Trager, Y. Chen, R. Peletier, B. Aringer, and W. Nowotny</i>	233
Analysis of stellar wind structure of massive star through their X-ray spectra <i>A. Hervé</i>	237
Stochastic excitation of gravito-inertial waves in rotating stars <i>S. Mathis, and C. Neiner</i>	241
Impact of new atomic data for the formation of the Mg I 4571 Å line in benchmark stars <i>T. Merle, F. Thévenin, M. Guitou, N. Feautrier, A. Spielfiedel, and O. Zatsarinny</i>	247
A study of the red supergiant Betelgeuse at high angular resolution <i>M. Montargès, P. Kervella, G. Perrin, and K. Ohnaka</i>	253
High resolution spectroscopy of M subdwarfs <i>A. S. Rajpurohit, C. Reylé, M. Schultheis, and F. Allard</i>	259
L'E-ELT : instrumentation et programmes scientifiques (S09)	265

ELT-CAM, the E-ELT first light imager <i>Y. Clénet</i>	267
Web-based scientific simulation tools for E-ELT instruments <i>K. Disseau, M. Puech, Y.B. Yang, H. Flores, F. Hammer, and L. Pentericci</i>	273
MOSAIC at E-ELT: A MOS for Astrophysics, IGM and Cosmology <i>F. Hammer, and (on behalf) the MOSAIC team</i>	277
Canary: a pathfinder of MOAO for ELT <i>O. Martin, E. Gendron, and G. Rousset</i>	281
HIRES: a high-resolution echelle spectrograph for the E-ELT <i>L. Origlia</i>	287
The ELT-MOS White Paper. <i>M. Puech, and the MOSAIC consortium</i>	293
The role of Super Stellar Cluster in extreme stellar formation: which programme for the E-ELT ? <i>D. Rouan, D. Gratadour, and C. Perrot</i>	297
Atelier PNHE/PNCG (S10)	301
Constraining gamma-ray propagation on cosmic distances <i>J. Biteau</i>	303
Search and Analysis of Galaxy-Scale Strong Gravitational Lenses in Cosmological Surveys <i>F. Brault</i>	313
SuperNova Legacy Survey 5 years : final type Ia supernova spectroscopic sample <i>F. Cellier-Holzem, and the SNLS collaboration</i>	319
How did $z=0$ galaxies ionize their environment during the reionization epoch ? <i>Jonathan Chardin, Dominique Aubert, and Pierre Ocvirk</i>	323
Nançay contribution to the worldwide pulsar programs <i>I. Cognard, G. Theureau, L. Guillemot, K. Liu, A. Lassus, and G. Desvignes</i>	327
Detection of the tSZ effect with the <i>NIKA</i> camera <i>B. Comis, R. Adam, A. Adane, P. Ade, P. André, A. Beelen, B. Belier, A. Benoît, A. Bideaud, N. Billot, et al.</i>	331
Planck results - Non Gaussianity constrained with Minkowski Functionals <i>Anne Ducout, and Planck Collaboration</i>	337
Star formation efficiency at high z and subgalactic scales <i>J. Freundlich, F. Combes, L. J. Tacconi, M. C. Cooper, R. Genzel, R. Neri, and the PHIBSS consortium</i>	343
Modelling the relative velocities of isolated pairs of galaxies <i>V. Gonzalez-Perez, E. Jennings, M.-C. Cousinou, S. Escoffier, A. Tilquin, and A. Ealet</i>	347
Measurement of the thermal Sunyaev-Zel'dovich angular power spectrum with Planck. <i>G. Hurier, and The Planck Collaboration</i>	351
Probing the Dark Energy through the integrated Sachs-Wolfe effect <i>S. Ilić</i>	357

The Search for new Milky Way Dwarf Galaxies in the Pan-STARRS 1 panoptic survey <i>B. P. M. Laevens, N. F. Martin, H.-W. Rix, and Pan-STARRS 1 collaboration</i>	363
Optical study of the DAFT/FADA galaxy cluster survey <i>N. Martinet, F. Durret, D. Clowe, C. Adami, and the DAFT/FADA team</i>	367
The extended HI disk of the nearby spiral galaxy NGC 2683 <i>F. Nehlig, B. Vollmer, and R. Ibata</i>	373
Gamma-ray bursts as cosmological probes <i>S.D. Vergani</i>	377
Champ magnétique interstellaire et circumstellaire, mesures, structure et origine (S12)	383
Properties of interstellar filaments as revealed by the <i>Herschel</i> Gould Belt survey <i>D. Arzoumanian, Ph. André, N. Peretto, V. Könyves, and P. Palmeirim</i>	385
Magnetic field and angular momentum evolution models <i>Florian Gallet</i>	391
Angular momentum redistribution by a SASI spiral mode and its consequences for the spin of neutron stars <i>J. Guilet, and Gordon I. Ogilvie</i>	395
Magnetic fields in old supernova remnants <i>A. Gusdorf, T. Hezareh, S. Anderl, and H. Wiesemeyer</i>	399
Cosmic Ray transport in the turbulent interstellar medium <i>A. Marcowith, R. Cochet, and C.D. Vigh</i>	403
The role of cosmic rays in the protostellar disc formation <i>M. Padovani, P. Hennebelle, and D. Galli</i>	409
The structure of the thermally bistable, turbulent and magnetized atomic gas <i>E. Saury, A. Bracco, F. Boulanger, M.-A. Miville-Deschênes, and P. Hennebelle</i>	415
Enseignement (S13)	421
Master training course for detection techniques <i>P. Kern</i>	423
Atelier de l'AS SKA-Lofar (S14)	427
Simulations of the baryonic acoustic oscillations 21 cm signal during the Reionization <i>Dominique Aubert</i>	429
Low frequency emission in galaxy clusters- <i>MACSJ0717.5 + 3745</i> <i>M. Pommier, J. Richard, F. Combes, K. Dwarakanath, B. Guiderdoni, C. Ferrari, and D. Narasimha</i>	433
Characterization and Initial Results with EMBRACE <i>S.A. Torchinsky, A.O.H. Olofsson, A. Karastergiou, B. Censier, M. Serylak, P. Renaud, and C. Taffoureau</i>	439
Atelier du PNHE (S15)	445

Athena+: The first Deep Universe X-ray Observatory <i>D. Barret, K. Nandra, X. Barcons, A. Fabian, J.W. den Herder, L. Piro, M. Watson, J. Aird, G. Branduardi-Raymont, M. Cappi, et al.</i>	447
The spectral catalogue of <i>INTEGRAL</i> gamma-ray bursts <i>Z. Bosnjak, D. Götz, L. Bouchet, S. Schanne, and B. Cordier</i>	455
Angular momentum redistribution by a SASI spiral mode and its consequences for the spin of neutron stars <i>J. Guilet, and Rodrigo Fernández</i>	459
Study of ultra-high energy cosmic rays from the radio signal at the Pierre Auger Observatory <i>Jennifer Maller, and for the Pierre Auger Collaboration</i>	465
Circumstellar bubble created by two massive stars <i>Z. Meliani, A. J. van Marle, and A. Marcowith</i>	471
Dust in the wind I: Spectropolarimetric signatures from disk-born outflows <i>F. Marin, and R. W. Goosmann</i>	475
Dust in the wind II: Polarization imaging from disk-born outflows <i>F. Marin, and R. W. Goosmann</i>	479
Recent results from the AMS-02 experiment in space <i>M. Vecchi, and the AMS-02 Collaboration</i>	483
Quasi-periodic oscillations from Rossby Wave Instability <i>F. H. Vincent, P. Varniere, H. Méheut, T. Paumard, G. Török, and M. Wildner</i>	487
SPIRou : un SpectroPolarimètre InfraRouge pour le CFHT (S17)	491
Perspectives for the study of gas in protoplanetary disks and accretion/ejection phenomena in young stars with the near-IR spectrograph SPIROU at the CFHT <i>A. Carmona, J. Bouvier, and X. Delfosse</i>	493
World-leading science with SPIRou - The nIR spectropolarimeter / high-precision velocimeter for CFHT <i>X. Delfosse, J.-F. Donati, D. Kouach, G. Hébrard, R. Doyon, E. Artigau, F. Bouchy, I. Boisse, A.S. Brun, P. Hennebelle, et al.</i>	497
Characterizing small planets transiting small stars with SPIRou <i>A. Santerne, J.-F. Donati, R. Doyon, X. Delfosse, E. Artigau, I. Boisse, X. Bonfils, F. Bouchy, G. Hébrard, C. Moutou, et al.</i>	509
Atelier PNCG : IR galaxies (S18)	515
New results from the <i>Herschel</i> Reference Survey <i>A. Boselli</i>	517
UV-to-IR spectral energy distributions of galaxies at $z > 1$: the impact of <i>Herschel</i> data on dust attenuation and star formation determinations <i>V. Buat, S. Heinis, and M. Boquien</i>	521
Dust attenuation and FUV+FIR star formation rate density: what did we learn from <i>Herschel</i> and what would <i>WISH</i> bring? <i>D. Burgarella, V. Buat, C. Gruppioni, O. Cucciati, S. Heinis, T. Yamada, I. Iwata, and the PEP/HerMES team</i>	525

Emission line properties from broad-band photometry: impact on selection and physical parameter estimation <i>S. de Barros, H. Nayyeri, N. Reddy, and B. Mobasher</i>	531
The M33 CO(2-1) survey - Star formation and molecular clouds formation <i>C. Druard, J. Braine, and K. F. Schuster</i>	537
Extreme [CII] line cooling in radio-galaxies: a signature of turbulent dissipation in active galactic nuclei? <i>P. Guillard, N. Nesvadba, P. Ogle, M. Lehnert, F. Boulanger, P. Appleton, and G. Pineau des Forêts</i>	541
Mass assembly in quiescent and star-forming galaxies since $z \simeq 4$ from UltraVISTA DR1 in the COSMOS field <i>O. Ilbert, H. J. McCracken, O. Le Fèvre, P. Capak, J. Dunlop, A. Karim, M. A. Renzini, K. Caputi, S. Boissier, and the COSMOS team</i>	545
Searching for protoclusters in the far-infrared with Herschel/SPIRE <i>E. E. Rigby, H. J. A. Röttgering, N. A. Hatch, B. Sibthorpe, Y. K. Chiang, and R. Overzier</i>	549
L’exploration des systèmes planétaires avec PLATO (S19)	553
Astrophysical false positives in exoplanet transit surveys: why do we need bright stars ? <i>A. Santerne, R. F. Díaz, J.-M. Almenara, A. Lethuillier, M. Deleuil, and C. Moutou</i>	555
Session annulée: Patrimoine des Observatoires	561
De astronomicis instrumentis in Universitate monspeliensi <i>H. Reboul</i>	563
Author Index	567