

# Harmonia Meeting III

Wednesday, 29 November 2017 from **09:30** to **20:00** (Europe/Warsaw)  
at **Faculty of Physics ( 5.42 )**  
Pasteura 5, 02-093

**Description** This will be the 3rd HARMONIA Warsaw-Lisbon-Catania-Dresden meeting. Unfortunately, Maria Krawczyk, the real spiritus moves of our project, is no longer with us. To honor Maria's memory we want to continue our collaboration.

The one-day meeting will take place at the OCHOTA campus of the University of Warsaw (room 5.42) on November 29th 2017, preceding SCALARS 2017 conference (Nov.30-Dec.3.2017).

HARMONIA project "Investigation of extensions of the Standard Model including the effects of "new physics" up to the Planck scale and the current the LHC and astrophysical data" (2016-2019) is realized by four nodes:

- 1/ Faculty of Physics, University of Warsaw, Warsaw, Poland (leader J. Kalinowski)
- 2/ CFTC Faculdade de Ciencias da Universidade de Lisboa, Lisbon, Portugal (leader R. Santos)
- 3/ Dipartimento di Fisica e Astronomia - Universita di Catania, Italy (leader V. Branchina)
- 4/ Institut fuer Kern- und Teilchenphysik, Technische Universitaet Dresden, Germany, (leader D. Stoeckinger)

Link to Harmonia Meeting II  
<http://indico.fuw.edu.pl/conferenceDisplay.py?confId=54>

**Participants** Vincenzo Branchina; Gustavo C. Branco; Filippo Contino; Neda Darvishi ; Ivo de Medeiros Varzielas; Philip Diessner; Howard Haber; Igor Ivanov; Jan Kalinowski; Venus Keus; Wojciech Kotlarski; Krzysztof Meissner; Misiak Mikołaj; Per Osland; Ferreira Pedro; Margarida Nesbitt Rebelo; Krzysztof Rolbiecki; Rui Santos; Dorota Sokolowska; Dominik Stoeckinger; Bogumila Swiezewska

**Registration** Want to participate? [Apply here](#)

## Wednesday, 29 November 2017

|               |                                      |
|---------------|--------------------------------------|
| 09:40 - 10:00 | coffee/tea                           |
| 10:00 - 13:00 | presentations and general discussion |
| 13:00 - 15:00 | lunch ( )                            |
| 15:00 - 18:00 | discussions in subgroups             |
| 18:30 - 20:00 | dinner ( )                           |

Harmonia Project: ( from 12.04.2016 for 36 months)  
to carry out research in cooperation with foreign partners

Investigation of extensions of the Standard Model including the effects of  
"new physics" up to the Planck scale and the current the LHC and  
astrophysical data

**Warsaw:**

J. Kalinowski, K. Rolbiecki, D. Sokolowska, B. Swiezewska, A. Ilnicka, I. Ginzburg,  
N. Darvishi, M. Misiak

**Catania:**

Vincenzo Branchina, Dario Zappala, Eloisa Bentivegna, Marc Sher,  
Filippo Contino

**Dresden:**

Dominik Stoeckinger, Wojciech Kotlarski, Philip Diessner, Tania Robens,  
Markus Bach, Hyejung Stoeckinger-Kim

**Lisboa:**

Rui Santos, Gustavo Branco, Raul Costa, Eduardo Dias, Pedro Ferreira,  
Igor Ivanov, Gui Rebelo, Marco Sampaio, Joao da Silva, Ivo de Medeiros  
Varzielas

## Tasks:

1. Investigation of models with two scalar doublets in light of LHC data - search of heavy and very light scalars (W,C,D,L)
2. Analysis of the newest Dark Matter data in the Higgs-portal models (W,C,D,L)
3. Inclusion of loop corrections in processes with scalars (W,C,D,L)
4. Early Universe in non-supersymmetric models and vacuum stability (W,C,L)
5. Conditions of vacuum stability in models with doublets and singlets of  $SU(2)$  in flat and curved space-time (W,C,L)
6. Investigation of the electroweak/strong processes and Dark Matter in supersymmetric models with R symmetry (W,D)

## Publications:

2016:

1. N. Darvishi, M. Krawczyk, CP violation in the Standard Model with a complex singlet, arXiv
2. Neda Darvishi, Baryogenesis of the Universe in cSMCS model plus Isodoublet vector quark, JHEP11(2016)065
3. A. Cordero-Cid, J. Hernández-Sánchez, V. Keus, S.F. King, S. Moretti, D. Rojas, D. Sokołowska, CP violating scalar Dark Matter, JHEP12(2016)014
4. A.G. Akeroyd, I. Ginzburg, M. Krawczyk, R. Santos, D. Sokołowska et al., Prospects for charged Higgs searches at the LHC, Eur.Phys.J.C77(2017)276
5. M.J. Boland, M. Krawczyk, J. Kalinowski et al., Updated baseline for a staged Compact Linear Collider, CERN Yellow Report CERN-2016-004

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6. H.Abramowicz, M. Krawczyk, J. Kalinowski et al., Higgs Physics at the CLIC Electron-Positron Linear Collider, Eur.Phys.J.C77(2017) 475
  7. J. Kalinowski, W. Kotlarski, E.Richter-Was, Z. Was, Production of tau lepton pairs with high  $p_T$  jets at the LHC and the TauSpinner reweighting algorithm, Eur.Phys.J.C76(2016)540
  8. I. F. Ginzburg, Triple Higgs coupling in the most general 2HDM at SM-like scenario, Eur.Phys.J.C77(2017)9
  9. I. F. Ginzburg, M. Krawczyk, A simple criterium for CP conservation in the most general 2HDM, Phys.Rev.D96(2017)055030
  10. W. Kotlarski, Sgluons in the same-sign lepton searches, JHEP02(2017)027

2017:

1. M. Krawczyk, S. Moretti, P. Osland, GM. Pruna, R. Santos, Prospects for 2HDM charged Higgs searches, J.Phys.Conf.Ser.873(2017)012048
2. A. Ilnicka, M. Krawczyk, T. Robens, D. Sokolowska, IDM and not only, PoS CORFU2016 (2017) 030
3. I. Ginzburg, M. Krawczyk, A simple criterium for CP conservation in the most general 2HDM, J.Phys.Conf.Ser.873(2017)012034
4. N. Darvishi, M. Krawczyk, Implications of quadratic divergence cancellation in the two Higgs doublet, model, Nucl.Phys.B926(2017)167
5. N. Darvishi, M.R. Masouminia, Phenomenological study on the production of Higgs bosons in the cSMCS model at the LHC, Nucl.Phys.B923 (2017) 491

6. N. Darvishi, Extension of standard model with a complex singlet in the two Higgs doublet model, J.Phys.Conf.Ser.873(2017)012028
7. D. Sokolowska, Dark matter and CP-violation in the three Higgs doublet model, J.Phys.Conf.Ser.873(2017)012030
8. M. Bahmani, J. Kalinowski, W. Kotlarski, E. Richter-Was, Z. Was, Systematics of TauSpinner for tau pairs with two hard jets and its recent developments, Acta Phys.Polon.B48(2017)903
9. M. Bahmani, J. Kalinowski, W. Kotlarski, E. Richter-Was, Z. Was, Production of tau tau jj final states at the LHC and the TauSpinner algorithm: the spin-2 case, submitted for pub.
10. W. Kotlarski, Scalar color octets and triplets in the SUSY with R-symmetry, J.Phys.Conf.Ser.873(2017)012043,
11. W. Kotlarski, Analysis of the R-symmetric supersymmetric models including quantum corrections, PhD Thesis

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12. P. Diessner, W. Kotlarski, S. Liebschner, D. Stoeckinger, Squark production in R-symmetric SUSY with Dirac gluinos: NLO corrections, JHEP10(2017)142
  13. M. Grazzini, A. Ilnicka, M. Spira, M. Wiesemann, Effective field theory in quest to parametrize Higgs properties: the transverse momentum spectrum case, J.Phys.Conf.Ser.873(2017)012050
  14. I. Ginzburg, Discrete and continuous description of physical phenomena, J.Phys.Conf.Ser.873(2017)012046
  15. G.C. Branco, M.N. Rebelo, Discrete charm of flavour and CP violation, J.Phys.Conf.Ser.873(2017)012011
  16. D. Emmanuel-Costa, O.M. Ogreid, P. Osland, M.N. Rebelo, Spontaneous symmetry breaking in three-Higgs-doublet  $S_3$ -symmetric models, J.Phys.Conf.Ser.873(2017)012007
  17. P.M. Ferreira, I.P. Ivanov, E. Jimenez, R. Pasechnik, H. Serodio, CP4 miracle: shaping Yukawa sector with CP symmetry of order four, arXiv:1711.02042



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18. P. Basler, P.M.Ferreira, M. Muhlleitner, R. Santos, High scale impact in alignment and decoupling in two-Higgs doublet model, arXiv:1710.10410
  19. R. Costa, M.O. Sampaio, R. Santos, NLO electroweak corrections in general scalar singlet models, JHEP1707(2017) 081
  20. E. Bentinegna, V. Branchina, F. Contino, D. Zappala, Impact of new physics on the EW vacuum stability in a curved spacetime background, arXiv:1708.01138
  21. I. de Medeiros Varzielas, S. King, Ch. Luhn, T. Neder, Spontaneous CP violation in multi-Higgs potentials with triplets of  $\Delta(3n^2)$  and  $\Delta(6n^2)$ , arXiv:1706.07606
  22. I. de Medeiros Varzielas, T. Neder, Y.L. Zhou, Effective alignments as building blocks of flavour moders, arXiv:1711.05716

Budget: (in PLN

1 euro ~ 4.2 PLN)

Planned

spent

2016 168762

103796

2017 337524

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