

Supported Projects

Projects supported by the INCD infrastructure

- [2023](#)
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- [2020](#)
- [2019](#)
- [2018](#)
- [2017](#)

2023

1. FCT 2022-2024 (PTDC/BIA-EVL/4345/2021) HYBRIDOMICS: Can hybridization fuel adaptation and species response to environmental change? Genomics and proteomics of endemic Iberian freshwater fish.
2. Human Frontiers Science Program 2020-2024 (RGY0081/2020) Chance or curse? The consequences of hybridization in a changing world
3. PTDC/BIA-EVL/2398/2021): Deleterious and compensatory mutations and their role in evolutionary radiations.
4. 2021.00238.CEECIND/CP1672/CT0002
5. H2020-FETOPEN PURE Precisely Patterned Nanofibers for High Performance Bioseparations 899732 International 2020-10 2024-09 FCT NOVA Pure Project – Sustainable Bioseparations (pure-fetopen.eu) Coordinator
6. FCT-MCTES Project Grants PROTEIOS PROTEIOS - Materiais proteicos para sensorização não invasiva PTDC/CTM-CTM/3389/2021 National 2022-01 2025-01 FCT NOVA
7. H2020-ERC ENSURE ENSURE: Non-invasive follow-up of urinary tract cancers 101069405 International 2022-07 2023-12 FCT NOVA O
8. PRR HfPT Health from Portugal C630926586-00465198 National 2022-09 2025-12 FCT NOVA
9. Em busca de bacteriófagos para a bioconservação de alimentos e bebidas: uma nova abordagem para prevenir a deterioração por *Alicyclobacillus* spp. 2022.04043.PTDC
10. FCT: ExtremeOceans - Unravelling evolutionary physiology landscapes of coastal marine fauna under extreme temperatures using a multi-layer Systems Biology approach, ref. PTDC/BIA-BMA/1494/2020
11. FCT-DAAD: AQUATROPHYS - Marine molecular networks for sustainable fisheries and AQUAculture: modeling TROPical fish nutritional quality and PHYSiology under global change, ref. 2021.09718.CBM
12. Biodiversa+: EASMO: Eastern Tropical Pacific reef fish on the move: biodiversity reorganisation and societal consequences (BiodivClim 452, BiodivClim/0001/2019) DANUBIUS Implementation Phase Project (DANUBIUS-IP). Grant agreement ID: 101079778. Horizon Europe. Funded under Research infrastructures. DOI: 10.3030/101079778.
13. CONNECT - local Coastal monitoring service for Portugal. LNEC/MARE/FCUL/FCID. Mercator Ocean International
14. SALMONLINK – Contribution of scientists and fishermen for the conservation and participated management of Atlantic salmon populations in Portugal (MAR-01.03.02-FEAMP-0048). Funded by Programa Operacional MAR2020
15. LIFE PREDATOR - PREvent, Detect and combAT the spread Of SiluRus glanis in south european lakes to protect biodiversity (LIFE21-NAT-IT-PREDATOR). Funded by LIFE Programme
16. MeroSW - Ação de repovoamento dirigida ao mero-legítimo na costa sudoeste. Funded by VIRIDIA Foundation

17. DiadSea - Transnational cooperation to improve the management and conservation of diadromous fish at sea (EAPA_0011/2022). Funded by Interreg Atlantic Area .
18. CEEC2020 - Development of Biocatalysts for Industrial Applications: From plastic degradation to the pharmaceutical chemistry 2020.01423.CEECIND - Individual CEEC - Investigador Auxiliar Level (FCT) 2021-2027
19. Brainplayback (EXPL/PSI-GER/0948/2021)
20. Title: " The effect of dual HER2 blockade on anti-tumor immune cells" Collaboration between iBET and IPOFG, funded by iNOVA4Health and IPOLFG.
21. BeONE (Building Integrative Tools for One Health Surveillance) project of the "One Health European Joint Program" funded by European Union's Horizon 2020 Research and Innovation program under grant agreement No 773830 (<https://onehealthejp.eu/projects/foodborne-zoonoses/jrp-beone>)
22. TELE-Vir (<https://onehealthejp.eu/projects/emerging-threats/jrp-tele-vir>) project of the "One Health European Joint Program" funded by European Union's Horizon 2020 Research and Innovation program under grant agreement No 773830 (<https://onehealthejp.eu/projects/emerging-threats/jrp-tele-vir>)
23. PathoGenSurveil project funded by national funds through FCT—Foundation for Science and Technology, I.P., in the frame of Individual CEEC 2022.00851.CEECIND/CP1748/CT0001
24. DURABLE - Delivering a Unified Research Alliance of Biomedical and public health Laboratories against Epidemics"(<https://www.insa.min-saude.pt/category/projectos/durable>; <https://durableproject.org/>). International project co-funded by the European Union on behalf of the EU4Health programme ("Project no. 101102733")
25. GENEIO - Sustainable use and integration of enhanced infrastructure into routine genome-based surveillance and outbreak investigation activities in Portugal (<https://www.insa.min-saude.pt/category/projectos/geneio/>). Project co-funded by the European Union, on behalf of the EU4Health programme (EU4H-2022-DGA-MS-IBA-1) ("Grant/2021/PHF/23776") ("Project no. 101113460").
26. CENTAUR - Creating and refining whole-genome and core-genome typing schemas for pathogen surveillance. International project co-funded by the European Union on behalf of the ISIDORE JRA programme (<https://isidore-project.eu/>) ("Project no. 101046133").
27. "824093 - STRONG-2020 "; "The strong interaction at the frontier of knowledge:fundamental research and applications"
28. "CERN/FIS-INS/0013/2021"; "Participation in the RD51 Collaboration at CERN"
29. "CERN/FIS-TEC/0017/2021"; "ImprovingPT: Optimization, construction and first in-beam tests of range monitoring and quality assurance systems for the improvement of proton therapy"
30. "AI4EOSC"; "Artificial Intelligence for the European Open Science Cloud"
31. "DT-GEO"; "A Digital Twin for GEOPhysical extremes"
32. "ESA: 4000137865/22/ES/JD"; "Expert Suport to BERM & RADEM units"
33. "CERN/FIS-PAR/0010/2021"; "Collaboration in the ATLAS experiment at CERN"
34. "CERN/FIS-COM/0018/2021"; "Suporte para o tier-2 de ATLAS e CMS no contexto do WLCG MoU entre Portugal e o CERN"
35. "CERN/FIS-PAR/0023/2021"; "Multiquarks structure - Nuclear Physics and Strong Interaction Group"

36. "CERN/FIS-PAR/0007/2021";"Colaboração na experiência AMS da estação espacial internacional para deteção de raios cósmicos de energia intermédia"
37. "CERN/FIS-PAR/0012/2021";"AugerEnhance_Upgrade of the measuring capabilities of the Pierre Auger Observatory"
38. "CERN/FIS-PAR/0035/2021";"PPatFCC_Participação Portuguesa no Futuro Colisionador Circular (FCC)"
39. "CERN/FIS-PAR/0005/2021";"Collaboration in the operation and physics data analysis at the CMS experiment at CERN"
40. "CERN/FIS-PAR/0014/2021";"DUNE - Calibration of ProtoDUNE-II at CERN"
41. "CERN/FIS-PAR/0009/2021";"RENASCER_Estudos de reações nucleares para Astrofísica Nuclear na instalação ISOLDE do CERN"
42. "CERN/FIS-INS/0028/2021";"LHC-SND_Participation in the SND@LHC experiment at CERN"
43. "PTDC/FIS-PAR/4300/2020";"SWG0: the wide-field gamma-ray observatory at the Southern hemisphere"
44. "PTDC/FIS-PAR/2679/2021";"Neutrinoless double beta decay search with the SNO+ experiment"
45. "PTDC/FIS-PAR/1214/2021";"Precision timing with forward protons at the HL-LHC"
46. "PTDC/FIS-MAC/2045/2021";"Excitações em materiais quânticos 2D/INL"
47. YoctoLHC ";"Yoctosecond imaging of QCD collectivity using jet observables" (835105)
48. "FARE";"Fake News and Real People – Using Big Data to Understand Human Behaviour" (853566)
49. interTwin (ID:101058386);"An interdisciplinary Digital Twin Engine for science"
50. "iMagine";"Imaging data and services for aquatic science (Grant Agreement 101058625)"
51. "FARE_AUDIT";"Fake News Recommendations - an Auditing System of Differential Tracking and Search Engine Results" (101100653)
52. EuroCC 2";"National Competence Centres for High Performance Computing";"69902142"
53. EXPL/EME-NUC/1311/2021";"DLight: New Plastic Scintillators for Future Light-based Detectors"
54. RESETTING "Relaunching European Smart and sustainable Tourism models Through digitalization and INnovative technoloGies". COSME PROGRAMME (EISMEA) UNDER GRANT AGREEMENT NO.101038190 2022.23037.CPCA.A0
55. 2022.26279.CPCA.A0
56. 2022.28046.CPCA.A0
57. 2022.38032.CPCA.A0
58. 2022.38089.CPCA.A0
59. 2022.38203.CPCA.A0
60. 2022.41755.CPCA.A0
61. 2022.42446.CPCA.A0
62. 2022.46814.CPCA.A0
63. 2022.55180.CPCA.A0
64. 2022.55201.CPCA.A0
65. 2022.56669.CPCA.A0
66. 2022.56778.CPCA.A0
67. 2022.57951.CPCA.A0
68. 2022.58205.CPCA.A0
69. 2022.59005.CPCA.A0

70. 2022.59037.CPCA.A0
71. 2022.59222.CPCA.A0
72. 2022.69797.CPCA.A0
73. 2022.72436.CPCA.A0
74. 2022.72694.CPCA.A0
75. 2022.73550.CPCA.A0
76. 2022.73688.CPCA.A0
77. 2022.74292.CPCA.A0
78. 2022.74481.CPCA.A0
79. 2022.75021.CPCA.A0
80. 2022.75114.CPCA.A0
81. 2022.75159.CPCA.A0
82. 2022.75198.CPCA.A0
83. 2022.75203.CPCA.A0
84. 2022.75218.CPCA.A0
85. 2022.75275.CPCA.A0
86. 2022.15610.CPCA.A1
87. 2022.15800.CPCA.A1
88. 2022.15852.CPCA.A1
89. 2022.15854.CPCA.A1
90. 2022.15880.CPCA.A1
91. 2022.15894.CPCA.A1
92. 2022.15912.CPCA.A1
93. 2022.15913.CPCA.A1
94. 2023.05206.CPCA.A1
95. 2023.08586.CPCA.A1
96. 2023.09536.CPCA.A1
97. 2023.09537.CPCA.A1
98. 2023.09549.CPCA.A1
99. 2023.09581.CPCA.A1
- .00. 2023.09611.CPCA.A1
- .01. 2022.15760.CPCA.A2
- .02. 2022.15818.CPCA.A2
- .03. 2022.15825.CPCA.A2
- .04. 2021.09623.CPCA.A2
- .05. 2021.435377.CPCA.A1
- .06. 2021.00238.CEECIND/CP1672/CT0002
- .07. C-SCALE - Copernicus - eoSC AnaLytics Engine. Horizon 2020. grant agreement No 101017529.
- .08. EGI-ACE - EGI Advanced Computing for EOSC. Horizon 2020. grant agreement No. 101017567.
- .09. GBIF - Global Biodiversity Information Facility. Infrastructure in the FCT roadmap.
- .10. CoastNet - Portuguese Coastal Monitoring Network. Infrastructure in the FCT roadmap.
- .11. biodata - distributed infrastructure for Life and Health data for Portugal. Infrastructure in the FCT roadmap.

- .12. Polén - Polén Gestão de Dados de Investigação. Development of a research data repository for FCT.
- .13. digitaltwin - Centro de Investigação em Ciências da Informação, Tecnologias e Arquitetura (ISCTE)
- .14. dynapor - Modelo de micro simulação dinâmica para Portugal (ICS U.Lisbon)
- .15. fct-fccn - Hosting of services for FCT.
- .16. filhosmadrugada - projeto filhos da madrugada (FCSH)
- .17. iscte-bdata - data science in business administration (ISCTE)
- .18. iscte-cdsi - conception and development of information systems (ISCTE)
- .19. iscte-cognition - Behavior, Emotion & Cognition (ISCTE)
- .20. iscte-ml - research in machine learning (ISCTE)
- .21. iscte-pai - research in scholar administration (ISCTE)
- .22. ispa-dm - data mining in psychology (ISPA)
- .23. junitec - image processing (Junior Enterprise IST)
- .24. Inec-resccue - Climate Change Resilience Assessment Framework for Urban Areas (LNEC)
- .25. mdeos-isos - Model Driven Open Systems (ISEL)
- .26. Parlamento - investigação em Ciência Política através da computação (Nova SBE)
- .27. spbotanica - Lista Vermelha da Flora Vascular de Portugal Continental
- .28. uab-esbert - Universidade Aberta
- .29. uc-aesop - Autonomic Service Operation (ISEC)
- .30. uc-graphy - Graphy project (ISEC)
- .31. uc-stream - Data stream (ISEC)
- .32. ustreamsims - Integrated Modelling in Urban Systems and Streamflow Simulation in Rivers (LNEC)
- .33. EOSC-Future - Advancing European research through Open Science. Horizon 2020. Grant Agreement Number 101017536.

2022

1. Chance or curse? The consequences of hybridization in a changing world" Human Frontier Science Program – Young Researcher Award (RGY0081/2020) de 2020-2023
2. Projecto "HYBRIDOMICS: Can hybridization fuel adaptation and species response to environmental change? Genomics and proteomics of endemic Iberian freshwater fish." Projecto SR&TD da FCT (PTDC/BIA-EVL/4345/2021) de 2022-2024.
3. ExtremeOceans - Unravelling evolutionary physiology landscapes of coastal marine fauna under extreme temperatures using a multi-layer Systems Biology approach, ref. PTDC/BIA-BMA/1494/2020
4. AQUATROPHYS - Marine molecular networks for sustainable fisheries and AQUAculture: modeling TROPical fish nutritional quality and PHYSiology under global change, ref. 2021.09718.CBM
5. CERN/FIS-PAR/0007/2021 Colaboração na experiência AMS da estação espacial internacional para deteção de raios cósmicos de energia intermédia
6. Fundação La Caixa - Inês Ochoa
7. CERN/FIS-PAR/0010/2021 Collaboration in the ATLAS experiment at CERN
8. CERN/FIS-PAR/0026/2021 C-ATLAS Upgrade 2021/23
9. CERN/FIS-PAR/0012/2021 AugerEnhance_Aprimoramento das capacidades de medição do Observatório Pierre Auger
10. CERN/FIS-PAR/0020/2021 UHECR@Auger_UHECR Physics with the Pierre Auger Observatory
11. UC/INOVC + / MonNest MonNest – Nest Monitoring
12. CERN/FIS-INS/0029/2021 Collaboration in the Phase 2 Upgrade of the CMS experiment at CERN
13. CERN/FIS-PAR/0005/2021 Collaboration in the operation and physics data analysis at the CMS experiment at CERN
14. PTDC/FIS-PAR/1214/2021 Precision timing with forward protons at the HL-LHC
15. PTDC/FIS-PAR/2831/2020 Participation in the LUX-ZEPLIN experiment
16. PTDC/FIS-NUC/3933/2021 NEXT: Detection of the neutrinoless Double Beta Decay in Xe-136-the NEXT experiment
17. LISBOA-01-0247-FEDER-045924 // POCI-01-0247-FEDER-045924 TPPT - Time of flight PET for Proton Therapy
18. EOSC-synergy grant 857647 Integrating and managing services for the European Open Science Cloud
19. EUROCC
20. EGI-ACE Implementing the European Open Science Cloud
21. EOSC-Future European Open Science Cloud - Expanding Capacities by Building Capabilities
22. interTwin (ID:101058386)
23. AI4EOSC Artificial Intelligence for the European Open Science Cloud
24. DT-GEO A Digital Twin for GEOPhysical extremes

25. iMagine Imaging data and services for aquatic science (Grant Agreement 101058625)
26. EuroCC 2 National Competence Centres for High Performance Computing
27. INCD 01/SAICT/2016 - nº 022153 Infraestrutura Nacional de Computação Distribuída
28. CERN/FIS-COM/0018/2021 Suporte para o tier-2 de ATLAS e CMS no contexto do WLCG MoU entre Portugal e o CERN
29. 4000136945 GLOSS GLOSS: Gamma-ray Laue Optics and Solid State detectors (PRODEX Experiment Arrangement No. 4000136945)
30. EXPL/FIS-PAR/0333/2021 Terrestrial Gamma-ray Flash Science and Monitoring for Aviation Safety
31. CERN/FIS-PAR/0014/2021 DUNE_Calibração de ProtoDUNE-II no CERN
32. PTDC/FIS-PAR/2679/2021 Neutrinoless double beta decay search with the SNO+ experiment
33. CERN/FIS-PAR/0023/2021 Nuclear Physics and Strong Interaction Group
34. EXPL/FIS-NUC/0364/2021 Short range CORelations on Exotic nuclei at R3B/FAIR using tRPCs
35. CERN/FIS-PAR/0009/2021 RENASCER_Estudos de reações nucleares para Astrofísica Nuclear na instalação ISOLDE do CERN
36. LISBOA-01-0247-FEDER-045904 TPPT - Time of flight PET for Proton Therapy
37. CERN/FIS-PAR/0016/2021 COMPASS/AMBER_Colaboração nas Experiências COMPASS e AMBER do CERN
38. 824093 - STRONG-2020 Nuclear Physics and Strong Interaction Group
39. 835105 - YoctoLHC Yoctosecond imaging of QCD collectivity using jet observables
40. CERN/FIS-PAR/0032/2021 THbridgeEXP-II_A ponte entre Teoria e Experiência: Fenomenologia de Colisionadores (II)
41. PTDC/FIS-MAC/2045/2021 Excitações em materiais quânticos 2D/INL
42. CERN/FIS-COM/0004/2021 QML-HEP_Explorando a aprendizagem de máquina quântica como uma ferramenta para colisionadores de altas energias presentes e futuros
43. FARE (ERC) EC grant 853566 Fake News and Real People
44. ESA: 1-7560/13/NL/HB RADEM proto-flight model
45. ESA: 4000137865/22/ES/JD Expert Suport to BERM & RADEM units
46. PTDC/FIS-PAR/4300/2020 SWGO: the wide-field gamma-ray observatory at the Southern hemisphere
47. Sea2See (PTDC/BII-BIO/28878/2017)
48. Proteios (PTDC/CTM-CTM/3389/2021)
49. The MARVEN Project - The Portuguese biotechnological database for marine animal venoms and toxins (FA_05_2017_007) Date: 2019 -2022
 - Funding agency: Fundo Azul, Portugal
 - Budget: 200,000 EUR
 - Subjects: Toxins; Drug discovery; Omics; Marine natural products; Research-Industry crosstalk
50. WormALL- Marine invertebrates as source of novel biotoxins: Investigating function and application through Polychaeta venomomics (PTDC/BTA-BTA/28650/2017)
 - Date: 2018 -2022
 - Funding agency: FCT, Portugal
 - Budget: 240,000 EUR
 - Subjects: Drug discovery; Toxins; Omics; Marine Biotechnology

51. DNA barcoding aromatic, medicinal, and condiment plants from Portugal (PTDC/ASP-HOR/31074/2017)
52. Devising strategies to detect, reduce and eliminate taint-producing *Alicyclobacillus* spp. in food products
53. UIDB/04378/2020, Applied Molecular Biosciences Unit;
54. PTDC/QUI-QFI/31689/2017, RDB-TS: A reaction database for transition state information from quantum chemical calculations;
55. PTDC/ASP-AGR/30154/2017, Biopesticides and Food Preservatives from Nanoencapsulated Plant Extracts: Biological Evaluation, Molecular Modelling and Synthesis;
56. 2020.01423.CEECIND, Development of Biocatalysts for Industrial Applications: From plastic degradation to the pharmaceutical chemistry
57. No. 899732 (PURE Project, FET-Open)

2021

New FCT and international funded projects supported by INCD in 2021.

1. PTDC/BIA-EVL/1100/2020
 - "Harnessing comparative genomics to understand the role of horizontal acquired genes in the evolution of yeast metabolism"
2. POCI-01-0247-FEDER-039890
 - GIIP - Gestão inteligente de infraestruturas portuárias (POCI-01-0247-FEDER-039890 - GIIP - Gestão Inteligente de Infraestruturas Portuárias)
3. Portal de dados da Lista Vermelha da Flora Vascular de Portugal Continental
 - URL: <https://lvf.flora-on.pt/>
4. Flora-On – Flora de Portugal Interactiva
 - URL: <https://flora-on.pt/> (over 1 million access over 200.000 users)
5. DSAIPA/DS/0102/2019
 - Debaqi: fatores para a promoção do diálogo e comportamentos saudáveis em comunidades escolares online
6. PTDC/PSI-GER/31943/2017
 - Paterson □ Prototyping medical acoustic environments for the design of new auditory warning signals
7. UIDB/04378/2020
 - Applied Molecular Biosciences Unit;
8. PTDC/QUI-QFI/31689/2017
 - RDB-TS: A reaction database for transition state information from quantum chemical calculations;
9. PTDC/ASP-AGR/30154/2017
 - Biopesticides and Food Preservatives from Nanoencapsulated Plant Extracts: Biological Evaluation, Molecular Modelling and Synthesis;
10. 2020.01423.CEECIND
 - Development of Biocatalysts for Industrial Applications: From plastic degradation to the pharmaceutical chemistry
11. PTDC/BIA-BMA/1494/2020
 - ExtremeOceans - Unravelling evolutionary physiology landscapes of coastal marine fauna under extreme temperatures using a multi-layer Systems Biology approach
12. FA_05_2017_007
 - The MARVEN Project – The Portuguese biotechnological database for marine animal venoms and toxins
13. PTDC/BTA-BTA/28650/2017
 - WormALL- Marine invertebrates as source of novel biotoxins: Investigating function and application through Polychaeta venomomics
14. 2021.07128.BD
 - Rational Development of Nanomedicines for Cardiovascular Diseases.

15. 2020.09087.BD
 - In Silico Optimization of Biocatalysts for Plastic Biodegradation.
16. SFRH/BD/147276/2019
 - Development of biocidal formulations for effective biofouling control.
17. SFRH/BD/136594/2018
 - Innovative approach to fight tuberculosis and malaria targeting the extraordinary PLP synthase macromolecular complex.
18. SFRH/BD/137844/2018
 - New Drugs Against Biofilm Formation and Development: a Computational and Experimental Approach.
19. SFRH/BD/136746/2018
 - Rational development of new biocatalysts for the production of Parkinson Disease Drugs.
20. PD/BD/128032/2016
 - Novel insights on the interaction of lactoferrin with proton pumping ATPases towards understanding its antifungal and anticancer activities
21. SFRH/BD/115396/2016
 - Computational studies addressed to PLP-Dependent enzymes
22. SFRH/BD/114886/2016
 - Computational studies addressed to multifunctional enzyme complexes
23. PTDC/ASP-HOR/31074/2017
 - DNA barcoding aromatic, medicinal, and condiment plants from Portugal
24. Devising strategies to detect, reduce and eliminate taint producing Alicyclobacillus spp. in food products 2020.08210.BD
 - Tecnologias Agrárias e Alimentares Portugal Universidade Nova de Lisboa
25. PTDC/EME-REN/30866/2017
 - Harbour protection with dual chamber oscillating water column devices (HARBOUR OWC)
26. CERN/FIS-PAR/0033/2019
 - ATLAS Upgrade 2019/20
27. CERN/FIS-PAR/0002/2019
 - Collaboration in the ATLAS experiment at CERN (2019-2021)
28. CERN/FIS-PAR/0010/2021
 - Collaboration in the ATLAS experiment at CERN (2021-2023)
29. CERN/FIS-PAR/0026/2021
 - C-ATLAS Upgrade 2021/23
30. CERN/FIS-INS/0032/2019
 - Collaboration in the operation and physics data analysis at the CMS experiment at CERN
31. CERN/FIS-PAR/0025/2019
 - Collaboration in the operation and physics data analysis at the CMS experiment at CERN
32. CERN/FIS-INS/0029/2021
 - Collaboration in the Phase 2 Upgrade of the CMS experiment at CERN
33. PTDC/FIS-PAR/1214/2021
 - Precision timing with forward protons at the HL-LHC

34. CERN/FIS-PAR/0005/2021
 - Collaboration in the operation and physics data analysis at the CMS experiment at CERN
35. 824093 - STRONG-2020
 - The strong interaction at the frontier of knowledge: fundamental research and applications
36. 835105 - YoctoLHC
 - Yoctosecond imaging of QCD collectivity using jet observables
37. CERN/FIS-PAR/0029/2019
 - Estudos fenomenológicos em LHC na física de quarks top e bósons de Higgs
38. CERN/FIS-PAR/0024/2019
 - Bridging Theory and Experiment: Collider Phenomenology
39. CERN/FIS-PAR/0010/2019
 - Methods for Understanding Strong Interactions with Quarkonia
40. CERN/FIS-PAR/0037/2021
 - TopHiggsPheno - Estudos Fenomenologicos em LHC na Física de Quarks Top e Bósons de Higgs
41. EXPL/FIS-PAR/0905/2021
 - TopHiggsPheno - Estudos Fenomenologicos em LHC na Física de Quarks Top e Bósons de Higgs
42. EXPL/FIS-PAR/1195/2021
 - The Strong force and multiparticle dynamics at hadron colliders
43. CERN/FIS-PAR/0032/2021
 - The Strong force and multiparticle dynamics at hadron colliders
44. CERN/FIS-PAR/0022/2019
 - Collaboration in the COMPASS and AMBER experiments at CERN
45. CERN/FIS-PAR/0016/2021
 - COMPASS/AMBER_Colaboração nas Experiências COMPASS e AMBER do CERN
46. IF/00898/2015
 - Expl. 2015_VL - IF/00898/2015_Multiquarks
47. CERN/FIS-PAR/0023/2021
 - Nuclear Physics and Strong Interaction
48. CERN/FIS-PAR/0013/2019
 - Collaboration in the International Space Station Experiment AMS for the detection of intermediate energy cosmic rays
49. CERN/FIS-PAR/0007/2021
 - AMS-LIP_Colaboração na experiência AMS da estação espacial internacional para detecção de raios cósmicos de energia intermédia
50. CERN/FIS-PAR/0034/2019
 - Enhancement of the measurement capabilities of the Pierre Auger Observatory
51. CERN/FIS-PAR/0031/2019
 - UHECR Physics with the Pierre Auger Observatory
52. CERN/FIS-PAR/0012/2021
 - AugerEnhance_Aprimoramento das capacidades de medição do Observatório Pierre Auger
53. CERN/FIS-PAR/0020/2021

- UHECR@Auger_UHECR Physics with the Pierre Auger Observatory
- 54. PTDC/FIS-PAR/29158/2017 and POCI/01-0145-FEDER-029158
- 55. LATTES: an innovative detector for very high energy gamma ray astrophysics in the southern hemisphere
- 56. PTDC/FIS-PAR/4300/2020 SWGO: the wide-field gamma-ray observatory at the Southern hemisphere
- 57. IF/00248/2015/CP1311/CT0001 Expl. 2015_VL - IF/00248/2015/CP1311/CT0001
- 58. CERN/FIS-PAR/0012/2019 Underground Neutrino Physics: Participation in the DUNE and SNO+ experiments
- 59. CERN/FIS-PAR/0014/2021 DUNE_Calibração de ProtoDUNE-II no CERN
- 60. CERN/FIS-PAR/0014/2021 DUNE_Calibração de ProtoDUNE-II no CERN
- 61. ESA: 1-7560/13/NL/HB
 - RADEM proto-flight model
- 62. INCD 01/SAICT/2016
 - Infraestrutura Nacional de COmputação Distribuída
- 63. EOSC-hub EC grant 777536
 - Integrating and managing services for the European Open Science Cloud
- 64. EOSC-synergy EC grant 857647
 - European Open Science Cloud - Expanding Capacities by Building Capabilities
- 65. EGI-ACE EC
 - Implementing the European Open Science Cloud
- 66. FARE (ERC) EC grant 853566
 - Fake News and Real People
- 67. PTDC/FIS-PAR/29147/2017 and POCI/01-0145-FEDER-029147
 - BigDataHEP: Understanding Big Data in High Energy Physics: finding a needle in many haystacks
- 68. PTDC/FIS-MAC/2045/2021
 - Excitações em materiais quânticos 2D/INL
- 69. CERN/FIS-COM/0004/2021
 - QML-HEP_Explorando a aprendizagem de máquina quântica como uma ferramenta para colisionadores de altas energias presentes e futuros
- 70. EXPL/FIS-OUT/1185/2021
 - Muography as a new tool for geophysics
- 71. PTDC/CCI-COM/30142/2017 AQUAMON: Monitorização Confiável em Ambientes Aquáticos com Redes de Sensores sem Fios
- 72. ANI Sinergia Sistema inteligente para apoio ao uso eficiente de recursos e à gestão de emergências de inundação e de contaminação balnear em cidades costeiras
- 73. PTDC/CTA-AMB/28909/2017 MOSAIC.pt - Análise do risco de inundação costeira a partir de múltiplas fontes para comunidades seguras e desenvolvimento sustentável

2020

New FCT and international funded projects supported by INCD in 2020.

1. FA_05_2017_007
 - **"The MARVEN Project - The Portuguese biotechnological database for marine animal venoms and toxins"**
 - Funding agency: Fundo Azul, Portugal
2. PTDC/BTA-BTA/28650/2017
 - **WormALL- Marine invertebrates as source of novel biotoxins: Investigating function and application through Polychaeta venomomics (PTDC/BTA-BTA/28650/2017)**
 - Funding agency: FCT, Portugal
3. PTDC/MAR-BIO/0113/2014
 - **"GreenTech-Of pigments and toxins: an integrative approach to the biotechnological potential of a marine polychaete"**
 - Funding agency: FCT, Portugal
4. E-SiCure2
 - **Enhancing Security at Borders and Ports (E-SiCure2)**
 - Funded by: NATO (Science for Peace and Security Programme)
5. PTDC/FIS-PAR/31000/2017
 - **From Higgs Phenomenology to the Unification of Fundamental Interaction**
 - Funding agency: FCT, Portugal
6. PTDC/FIS-AST/3041/2020
 - **Testando a hipótese de Kerr com ondas e lentes gravitacionais**
 - Funding agency: FCT, Portugal
7. 03/SAICT/2015
 - **ONEIDA - An OMICS Network to Prevent and Control Infectious Diseases and Antimicrobial Resistance**
 - Funding agency: FCT,
8. CAMELOT: autonomiC pLAtform for MachinE Learning using anOnymized data
 - PortugalProjecto CMU|Portugal Camelot
9. PTDC/BIA-MIC/29529/2017
 - **"Exploring unique metabolic traits of biotechnological interest in fructophilic yeasts"**
 - Funding agency: FCT,
10. . PTDC/CTA-AMB/28909/2017
 - **MOSAIC.pt Análise do risco de inundação costeira a partir de múltiplas fontes para comunidades seguras e desenvolvimento sustentável**
 - Funding agency: FCT,
11. POCI-01-0247-FEDER-024541
 - **PRODUTECH-SIF: Soluções para a Indústria de Futuro**

- COMPETE2020
- 12. PTDC/BIA-MIC/30785/2017
 - **Advancing Wine Yeast Genomics - WYG**
 - Funding agency: FCT
- 13. PTDC/BIA-MIC/32059/2017
 - **Abordagens omicas para a exploração industrial de *Torulaspora delbrueckii*: elucidação das bases moleculares de fenótipos complexos**
 - Funding agency: FCT
- 14. Programa de monitorização dos fatores biológicos e ecológicos aquáticos no rio Mondego na envolvente da Central Termoelétrica de Lares
 - Funding agency: EDP
- 15. Monitorização Biológica da Frente Ribeirinha de Lisboa
 - Funding agency: CML
- 16. Monitorização da frente ribeirinha e respectivas comunidades biológicas e das atividades de pesca com xávega e ganchorra na zona costeira do Concelho de Almada.
 - Funding agency: CMA
- 17. Estado atual das populações de amêijoia-japonesa da Ria de Aveiro, lagoa de Óbidos e estuários do Tejo e Sado – bases científicas para uma gestão sustentável do recurso - NIPOGES
- 18. Co-Operation for Restoring Cockle Shellfisheries & its Ecosystem-Services in the Atlantic Area – COCKLES.
 - Funding agency: Interreg Atlântico
- 19. Promover a Gestão Concertada e Sustentável da Enguia na Área SUDOE-SUGOANG
 - Funding agency: Interreg Atlântico
- 20. Melhorar e complementar os critérios de classificação do estado das massas de água de transição e costeiras - MESCLA
 - Funding agency: APA-POSEUR
- 21. Innovation in the Framework of the Atlantic Deep Ocean (iFADO)
 - Funding agency: Interreg Atlântico
- 22. Caracterização geral das águas aquícolas para estabelecimento de culturas marinhas - AQUIMAR
 - Funding agency:
- 23. Dynamics of phytoplankton community through remote sensing: an assessment of eutrophication process and environmental quality - Phytotroph
 - Funding agency:FCT
- 24. Assessing and enhancing ecosystem services provided by diadromous fish in a climate change context - DiadES
 - Funding agency: Interreg Atlântico
- 25. Estudo integrado da dinâmica dos movimentos migratórios da corvina *Argyrosomus regius* - MIGRACORV
 - Funding agency:FCT
- 26. Effects of antropogenic noise on Fish fitness - FISHNOISE
 - Funding agency:FCT
- 27. Sistemas de informação e monitorização da biodiversidade marinha das Áreas Classificadas do Sudoeste Alentejano e Costa Vicentina - MARSW
 - Funding agency: POSEUR

28. Plano Operacional de Monitorização e Gestão de Peixes Anádromos em Portugal – AN@DROMOS
 - Funding agency:
29. FReshwater fish Invasions RiSk assessment: identify invasion routes - FRISK
 - Funding agency: FCT
30. PTDC/EME-REN/30866/2017 (FCT)
 - Harbour protection with dual chamber oscillating water column devices
 - Funding agency: FCT
31. PTDC/AAG-MAA/6899/2014
 - "UBEST - Understanding the biogeochemical buffering capacity of estuaries relative to climate change and anthropogenic inputs"
32. EOSC-synergy grant 857647
 - "European Open Science Cloud – Expanding Capacities by Building Capabilities"
33. EOSC-hub grant agreement No. 777536
34. AQUAMON – A dependable monitoring platform based on wireless sensor networks for water environments
 - Funding agency: FCT
35. UBEST: Understanding the biogeochemical buffering capacity of estuaries relative to climate change and anthropogenic inputs
 - Funding agency: FCT
36. INLEX - Infragravity waves on tidal inlets under extreme conditions
 - Funding agency: FCT
37. WADI Innovative Airborne Water Leak Detection Surveillance Service
 - Funding agency: Horizon 2020 Programme under grant agreement No. 689239
38. RESCCUE RESilience to cope with Climate Change in Urban arEas – a multisectorial approach focusing on water
 - H2020 Grant Agreement Number: 700174
39. FISH-DNA-SCAN “Cutting-edge DNA-based approaches for improved monitoring and management of fisheries resources along Magellan-Elcano's Atlantic route”
 - funded by FCT: 2020-2022.
40. NIS-DNA “Early detection and monitoring of non-indigenous species (NIS) in coastal ecosystems based on high-throughput sequencing tools”
 - funded by FCT: 2019-2021
41. PTDC/BIA-EVL/28565/2017. OCEANTREE – Mechanisms of reproductive allochrony in endemic Portuguese seabirds: implications for population divergence and response to climate change.
 - funded by FCT
42. A Management Framework for Consolidated Big Data and HPC BigHPC 04/SI/2019
43. RADEM proto-flight model ESA: 1-7560/13/NL/HB
44. aAmuse - advanced Muon Campus in US and Europe contribution aAmuse - Project 101006726
45. Designing and Enabling E-Infrastructures for intensive Processing in a Hybrid DataCloud DEEP-HybridDataCloud - Grant 777435
46. Integrating and managing services for the European Open Science Cloud EOSC-hub grant 777536

47. European Open Science Cloud – Expanding Capacities by Building Capabilities EOSC-synergy grant 857647
48. Innovating and Widening the HPC use and skills base EUROCC
49. Implementing the European Open Science Cloud EGI-ACE
50. EOSC-Future EOSC-Future
51. The strong interaction at the frontier of knowledge: fundamental research and applications 824093 - STRONG-2020
52. Yoctosecond imaging of QCD collectivity using jet observables 835105 - YoctoLHC Grant Agreement 853566 FARE - Fake News and Real People (ERC)
53. Collaboration in the International Space Station Experiment AMS for the detection of intermediate energy cosmic rays CERN/FIS-PAR/0013/2019
54. ATLAS Upgrade 2019/20 CERN/FIS-PAR/0033/2019
55. Collaboration in the ATLAS Experiment at CERN: Data Taking and Analysis CERN/FIS-PAR/0002/2019
56. UHECR Physics with the Pierre Auger Observatory CERN/FIS-PAR/0031/2019
57. Collaboration in the Phase 2 Upgrade of the CMS experiment at CERN CERN/FIS-INS/0032/2019
58. Collaboration in the operation and physics data analysis at the CMS experiment at CERN CERN/FIS-PAR/0025/2019
59. Participation in the RD51 Colaboration (Gaseous Detectors R&D) CERN/FIS-INS/0025/2017 (Gaseous Detectors R&D)
60. Participation in RD51 - GD CERN/FIS-INS/0025/2017 - GD
61. Participação em colaboração RD51 no CERN para desenvolvimento de detectores de partículas em microestruturas CERN/FIS-INS/0026/2019 (Gaseous Detectors R&D)
62. Portuguese National Distributed Computing Infrastructure INCD 01/SAICT/2016 - nº 022153
63. LATTES: an innovative detector for very high energy gamma ray astrophysics in the southern hemisphere PTDC/FIS-PAR/29158/2017
64. SWGO: the wide-field gamma-ray observatory at the Southern hemisphere PTDC/FIS-PAR/4300/2020
65. Underground Neutrino Physics: Participation in the DUNE and SNO+ experiments CERN/FIS-PAR/0012/2019
66. PORTUGAL at ISOLDE CERN/FIS-PAR/0005/2017 Collaboration in the COMPASS and AMBER experiments at CERN CERN/FIS-PAR/0022/2019
67. Jets as quark gluon plasma probes CERN/FIS-PAR/0022/2017
68. Heavy Quarkonium production in hadronic interactions at LHC and AFTER@LHC CERN/FIS-PAR/0015/2017
69. Estudos fenomenológicos em LHC na física de quarks top e bósons de Higgs CERN/FIS-PAR/0029/2019
70. Bridging Theory and Experiment: Collider Phenomenology CERN/FIS-PAR/0024/2019
71. Methods for Understanding Strong Interactions with Quarkonia CERN/FIS-PAR/0010/2019
72. BigDataHEP: Understanding Big Data in High Energy Physics: finding a needle in many haystacks PTDC/FIS-PAR/29147/2017, POCI/01-0145-FEDER-029147
73. TELE-VIR <https://onehealth.jp.eu/jrp-tele-vir/>
 - projecto internacional co-financiado pela Comissão Europeia no âmbito da identificação e caracterização de vírus que constituem uma ameaça para os seres

humanos

74. Genetic diversity of the novel coronavirus SARS-CoV-2 (COVID-19) in Portugal (<https://insaflu.insa.pt/covid19/>)
 - projecto co-financiado pela FCT e Agência de Investigação Clínica e Inovação Biomédica âmbito da primeira "call" Research 4 COVID-19.
75. Monitoring the integrity and genetic evolution of SARS-CoV-2 during infection, to support clinical and public health decision - projecto co-financiado pela FCT e
 - Agência de Investigação Clínica e Inovação Biomédica âmbito da segunda "call" Research 4 COVID-19.
76. "TraSyph - Tracing the Treponema pallidum genetic footprints associated with syphilis outcomes and stages"
 - projecto financiado pela European Society of Clinical Microbiology and Infectious Diseases (ESCMID)
77. GIIP - Gestão inteligente de infraestruturas portuárias (POCI-01-0247-FEDER-039890 - GIIP - Gestão Inteligente de Infraestruturas Portuárias)
78. Projecto financiado POSEUR-03-2215-FC-000013 - Lista Vermelha da Flora Vascular de Portugal Continental
 - Coordenação do projecto: Sociedade Portuguesa de Botânica, Associação Portuguesa de Ciência da Vegetação – PHYTOS, em parceria com o Instituto da Conservação da Natureza e das Florestas, I.P.
79. barcodingPTplants: DNA barcoding aromatic, medicinal, and condiment plants from Portugal
 - FCT: PTDC/ASP-HOR/31074/2017

2019

New FCT and international funded projects supported by INCD in 2019.

1. UID/BIA/00329/2013 **"CENTRE FOR ECOLOGY, EVOLUTION AND ENVIRONMENTAL CHANGES"**
2. Marie-Sklodowska Curie action MAPGenome (no. 799729) **"MAPGenome: Mapping migration and adaptation in genomes"**
3. PTDC/MHC-PSO/1044/2014 **"Cognição de equipas, adaptação e sistemas multi-equipas em ambientes dinâmicos"**
4. PTDC/AAG-MAA/6899/2014
 - **"UBEST - Understanding the biogeochemical buffering capacity of estuaries relative to climate change and anthropogenic inputs"**
5. PTDC/EEI-ESS/1189/2014
 - **"Data Science for Non-Programmers"**
6. POCI-01-0145-FEDER-016759
 - **"Intensificação do processo de produção e valorização de microalgas"**
7. DSAIPA/AI/0087/2018
 - **"Identifying and Predicting Emergency Admissions"**
8. DATACOR POCI-01-0145-FEDER-030256
 - **"dados inteligentes para desenhar inibidores de corrosão"**
9. EOSC-synergy grant 857647
 - **"European Open Science Cloud - Expanding Capacities by Building Capabilities"**
10. CENTRO-01-0145-FEDER-31002
 - **SILVIA - Modeling the synthesis of silica materials via multiscale computer simulations**
11. PTDC/FIS-MAC/32229/2017
 - ****NA**
12. AESOP P2020 - 31/SI/2017
 - **Criação de plataforma de orquestração micro serviços baseada em métricas de QoS ***
13. LISBOA-01-0145-FEDER-007660
 - **Microbiologia Molecular, Estrutural e Celular ***
14. UID/QUI/50006/2019
 - **Cálculo computacional utilizando Dinâmica Molecular Clássica & Metadynamics: cadeias de DNA, clatratos de gelo, líquidos iónicos**
15. UID/CCI/4667/2019
 - **NA**
16. STRONG 2020 The strong interaction at the frontier of knowledge: fundamental research and applications
17. H2020 | YoctoLHC Yoctosecond imaging of QCD collectivity using jet observables

18. H2020 | AMVA4NewPhysics - 675440 Advanced Multi-Variate Analysis for New Physics Searches at LHC
19. CERN/FIS-INS/0025/2017 | Participation in the RD51 Collaboration at CERN
20. CERN/FIS-INS/0032/2019 | Collaboration in the Phase 2 Upgrade of the CMS experiment at CERN
21. CERN/FIS-PAR/0002/2019 | Collaboration in the ATLAS Experiment at CERN: Data Taking and Analysis
22. CERN/FIS-PAR/0005/2017 | PORTUGAL at ISOLDE
23. CERN/FIS-PAR/0006/2017 | Collaboration in the CMS experiment at CERN
24. CERN/FIS-PAR/0007/2017 | Collaboration in the COMPASS experiment at CERN
25. CERN/FIS-PAR/0008/2017 | Collaboration in the ATLAS experiment
26. CERN/FIS-PAR/0022/2017 | Jets as quark gluon plasma probes
27. CERN/FIS-PAR/0023/2017 | Participação portuguesa no Observatório Pierre Auger
28. ESA: 1-7560/13/NL/HB | RADEM proto-flight model
29. PTDC/FIS-PAR/29147/2017 | igDataHEP: Understanding Big Data in High EnergyPhysics: finding a needle in many haystacks
30. PTDC/FIS-PAR/29158/2017 | LATTES: an innovative detector for very high energy gamma ray astrophysics in the southern hemisphere

2018

New FCT and international funded projects supported by INCD in 2018.

1. POCI-01-0145-FEDER-007679
 - **"CICECO-INSTITUTO DE MATERIAIS DE AVEIRO"**
2. PTDC/AGR-TEC/1191/2014
 - **"DEEPBIOREFINERY"**
3. H2020-EU.3.2.6 (668970)
 - **"PROcesses for Value added fibres by Innovative Deep Eutectic Solvents"**
4. PIAAC-AMAL
 - **"Elaboração do Plano Intermunicipal de Adaptação às Alterações Climáticas da AMAL"**
5. LISBOA-01-0145-FEDER-030895
 - **"INTERGEN : Inovação de GWAS em cancro da mama através da integração de genómica funcional "**
6. PTDC/EEI-SII/4698/2014
 - **"Human-aware service robots for domestic environments"**
7. CoastNet
 - **"Portuguese Coastal Monitoring Network"**
8. BINGO EC Grant 641739
 - **"BINGO A better future under CLIMATE CHANGE"**
9. EOSC-hub EC grant 777536
 - **"EOSC-hub"**
10. DEEP-HybridDataCloud - EC Grant 777435
 - **"DEEP-Hybrid-DataCloud"**
11. PTDC/FIS-PAR/29158/2017
 - **"LATTES: an innovative detector for very high energy gamma ray astrophysics in the southern hemisphere"**
12. PTDC/FIS-NUC/0640/2014 Participação portuguesa na experiência de física de neutrinos SNO+
13. PTDC/FIS-NUC/0640/2014 Participação portuguesa na experiência de física de neutrinos SNO+
14. PTDC/FIS-NUC/1525/2014 Direct Detection of Dark Matter: Participation in the LUX-ZEPLIN and LUX Experiments
15. PTDC/FIS-NUC/2525/2014 Detection of the Neutrinoless Double Beta Decay in Xe-136: the NEXT Experiment
16. PTDC/FIS-PAR/28567/2017 Participation in dark matter experiments LZ
17. PTDC/FIS-PAR/29147/2017 BigDataHEP: Understanding Big Data in High Energy Physics: finding a needle in many haystacks

2017

New FCT and international funded projects supported by INCD in 2017.

- P2020-PTDC/BIM-MED/0075/2014
 - **"Mechanisms underlying hemogenic induction in human fibroblasts"**
- NORTE-01-0246-FEDER-000014
 - **"DESVENDAR - DEScobrir, VENcer as Doenças rARas"**
- PTDC/BEX-BID/5410/2014
 - **"TIMING CELL DIFFERENTIATION: Gene Regulatory Network in Temporal Control of Mesoderm Specification"**
- SFRH/BPD/109685/2015
 - Bolsa de Doutoramento
- SFRH/BPD/104544/2014
 - Bolsa de Doutoramento
- PTDC/DTP-FTO/4973/2014
 - **"Desenvolvimento de antídotos para intoxicações por Amanita phalloides, do in silico ao doente intoxicado"**
- P2020-PTDC/EMS-ENE/5742/2014
 - **"UNsteady boUndary LAYer flow coNTrol using plasma actuators of Next generation"**
- SFRH/BD/92277/2013
 - Bolsa de doutoramento
- INCD 01/SAICT/2016 - nº 022153
 - **"INCD Infraestrutura Nacional de Computação Distribuída"**
- CERN/FIS-PAR/0008/2017
 - **"Collaboration in the ATLAS Experiment2"**
- CERN/FIS-PAR/0007/2017
 - **"Collaboration in the COMPASS Experiment at CERN"**
- CERN/FIS-PAR/0006/2017
 - **"Collaboration in the CMS experiment at CERN"**
- CERN/FIS-PAR/0005/2017
 - **"PORTUGAL AT ISOLDE : Materials and Nuclear Physics Research with Radioactive Isotopes and Techniques"**
- CERN/FIS-PAR/0020/2017
 - **"Collaboration in the International Space Station experiment AMS for the detection of intermediate energy cosmic rays"**
- CERN/FIS-PAR/0022/2017
 - **"Probing Quark Gluon Plasma with jets"**
- CERN/FIS-PAR/0023/2017
 - **"PORTUGUESE PARTICIPATION IN THE PIERRE AUGER OBSERVATORY"**
- CERN/FIS-PAR/0027/2017

- **"Prospective study for the Portuguese participation in CERN's Future Circular Collider"**
- CERN/FIS-PAR/0034/2017
 - **"Phenomenological Studies at the LHC"**
- CERN/FIS-INS/0025/2017
 - ***"Participation in the RD51 Colaboration"**
- IF/00248/2015/CP1311/CT0001
 - Individual project
- IF/00863/2013/CP1172/CT0006
 - Individual project
- PTDC/FIS-NUC/0640/2014
 - **"Portuguese Participation in the SNO+ Neutrino Physics Experiment"**
- ESA: 1-7560/13/NL/HB
 - **"RADEM proto-flight model"**
- ESA/4000115004/15/NL/RA/ZK
 - **"Flight Data Analysis of TDP8 Radiation Experiments On-board AlphaSat"**
- PTDC/FIS-PAR/28567/2017
 - **"Participation in dark matter experiments LZ"**
- PTDC/FIS-PAR/29147/2017
 - **"BigDataHEP: Understanding Big Data in High Energy Physics: finding a needle in many haystacks"**
- MELOA EC grant 776825
 - **"MELOA: Multi-purpose/Multi-sensor Extra Light Oceanography Apparatus"**