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6. Participating organisations

Table B4 – Data for non-academic Beneficiaries

Name	Location of research premises (city/country)	Type of R&I activities	No. of full - time employees involved in the project	No. of employees in R&I	Web site	Annual turnover (approx. in Euro)
Clever Operation	Orsay (FR)	Hardware/Software customized instrumentation and solutions	3	2	www.clever-operation.com	93 Thousand
Caen	Viareggio (IT)	Electronic Instrumentation for Nuclear Physics	74	34	www.caen.it	12 Millions
Seems	Alexandroupolis (GR)	Hardware/Firmware /Software IT Solutions	4	4	www.seems.gr	50 Thousand
SAES RIAL Vacuum	Parma (IT)	Hardware for cryogenic, ultra-high-vacuum and superconductive magnet applications	3	2	www.saesrial.com	3 Milions

Table B5 – Organisations (Beneficiaries and TC Partner organisations) data

Beneficiary Legal Name: Universita' di Pisa (UNIPI)	
General Description	UNIPI is one of the most prestigious universities in Italy: 20 Dep. with 1,500 research staff and 47,000 students. The Dep. of Physics has 80 academics research staff, 30 involved in particle physics research. With UNIMAN, UNIPI is one of the three European Univ. members of the US Univ. Res. Ass. (URA).
Role and Commitment of key persons (including supervisors)	**A. Papa**, Researcher; Member of MEG, MEG-II, Mu3e and muX; MEG-II Technical and Run Coordinator; Coordinator of MEG and MEG-II calibration groups; Coordinator of all MEG-II beams; Coordinator of PSI experimental areas; Coordinator of the MEG-II Exotic Physics group; Coordinator of the Mu3e scintillating fibre detector group at PSI; Coordinator of the UNIPI Summer School at PSI and Prakticum for Master students at PSI.. **F. Cei**, Associate Professor; Member of MEG, MEG-II, LSPE; Coordinator of the MEG Simulation group and Analysis group; Member of the LSPE Editorial Board. **V. Giusti**, Ass. Prof. at the Dep. of Civil and Industrial Engineering; Experience of numerical simulations of nuclear reactors, design of nuclear reactors, radiation transport models for neutron spectrometry and dosimetry, neutron design and validation of facilities for boron neutron capture therapy and research. **R. Ciolini**, Ass. Prof. at the Dep. of Civil and Industrial Engineering; Responsible of the Nuclear Measurements Laboratory at UNIPI; Experience of neutron dosimetry and spectrometry, development of new dosimetric techniques and neutron detectors, environmental radioactive measurements, radiation shielding, including use of Monte Carlo codes (MCNPX) for the simulation of neutron and gamma radiation transport. **F. D'Errico**, Full Prof. at the Dep. of Civil and Industrial Engineering; Fellow, Timothy Dwight College, Yale University, Vice-President of the International Solid State Dosimetry Organization (2004-2007), President of the International Solid Stated Dosimetry Organization (2007-2010); Editor in Chief, Radiation Measurements for Elsevier Science (2005-2011); Experience of neutron detectors for neutron dosimetry. **A. Marini**, Postdoc Res. Ass. at the Dep. of Civil and Industrial Engineering; experience of Monte Carlo and numerical simulations, radiation transport models for neutron spectroscopy and dosimetry.
Key Research Facilities, Infrastructure and Equipment	The Dep. of Physics has state-of-the-art research facilities, mechanical, electronics workshops and clean-rooms, and substantial computing resources. The Dep. of Civil and Industrial Engineering has state-of-the-art facilities to perform research in Aerospace, Chemical, Civil, Mechanical and Nuclear Engineering.
Status of Research Premises	Research facilities are owned by UNIPI and independent from other beneficiaries/partner organization in the consortium.
Previous Involvement in Research and Training Programmes	UNIPI has been involved in 76 FP7 projects. The particle physics group has been involved in many international projects, UA1, UA2, LEP, NOMAD, Na48, APE, NTA-ILC, NTA-PLASMONX, SuperB. The Dep. Of Physics has coordinaed FTK (324318) and TRIMAGE (602621) in FP7. The Dep. of Civil and Industrial Engineering has been involved in 3 FP7-EURATOM-FISSION Projects, THINS, SARNET2, SEARCH.
Current Involvement in Research and Training Programmes	UNIPI is involved in 78 H2020 projects for a total financial support of 21 Meuro. UNIPI coordinates 10 H2020 projects. The particle physics group is engaged in ATLAS, BaBar, Belle, CDF, CMS, Na62, MEG, Mu2e, LHCb, FERMI, VIRGO, Mu2e. The Dep. of Physics participates to 4 FP7 and 2 H2020 projects, and coordinates INTENSE (822185). The Dep. of Civil and Industrial Engineering participates in MYRTE - MYRRHA (662186) in H2020.
Relevant Publications and/or Research / Innovation Product	**[1]** F. Abe et al. (CDF Collaboration), "Observation top quark production in p-pbar collisions", Phys. Rev. Lett. 74 (1995) 2626-2631. **[2]** N. Atanov et al., "Design and status of the Mu2e electromagnetic calorimeter", Nucl. Instrum. Meth. A824 (2016) 695-698. **[3]** R. Ciolini et al., "A feasibility study of a SiC sandwich neutron spectrometer", Radiation Measurements 46 (2011), pp. 1634-1637. **[4]** V. Giusti, B. Montagnini, "A boundary element - Response matrix method for 3D neutron diffusion and transport problems", (2014) CMES - Computer Modeling in Engineering and Sciences, 102 (3), pp. 229-255. **[5]** V. Giusti, "Computational design and preliminary measurements of a mixed-field irradiation facility", (2008) Progress in Nuclear Energy, 50 (8), pp. 877-885.

Beneficiary Legal Name: Istituto Nazionale di Fisica Nucleare (INFN)	
General Description	INFN is the Italian research agency dedicated to the study of fundamental physics within a framework of collaboration with the most important research centers in the world. It conducts theoretical and experimental research in the fields of sub-nuclear, nuclear and astroparticle physics, in collaboration with Italian universities.
Role and Commitment of key persons (including supervisors)	**S. Donati**, Ass. Prof. at the Dep. of Physics; Member of CDF, ATLAS, and Mu2e; Coordinator of the CDF Trigger Group (2009-2011); Member of the Mu2e Inst. Board, CDF and Mu2e Speakers Committee; Coordinator of the UNIPI Summer School "Summer Students at FNAL and other US Laboratories"; Principal Investigator of the INTENSE (822185) H2020-MSCA-RISE; Principal Investigator of the NEWS (734303) H2020-MSCA-RISE; Member of the Steering Committee of the FTK (324318) FP7-PEOPLE-IAPP; chair of the Scientific Board and Member of the Management Board of MUSE (690835) H2020-MSCA-RISE; Principal Investigator of one PRA 2015 and one PRA 2017 project at UNIPI; Principal Investigator of the joint UNIPI-MIT MISTI Global Seed Funds research project; Awardee of the URA Visiting Scholar Program at FNAL in 2011, 2104 and 2016. **A. Baldini**, Director of Research; Member of MEG, MEG-II and LSPE; Spokesperson of MEG and MEG-II; National Coordinator of MEG and MEG-II at INFN. **F. Cei**, Associate Professor; Member of MEG, MEG-II, LSPE; Coordinator of the MEG Simulation group and Analysis group; Member of the LSPE Editorial Board. **F. Spinella (40%)**, Resercher; Physicist, expert of electronic design and DAQ systems; Coordinator of electronics projects for CDF, AMS, TOTEM, NA62 and Mu2e. **F. Raffaelli**, Director of Applied Research; Nuclear Engineer, expert of mechanics design; coordinator of international projects for CDF, CMS, VIRGO, NA62, KLOE, BaBar, SuperB, AMS, and Mu2e. **A. Guglielmi**, Director of Research, PI with C. Rubbia of the ICARUS-INFN experiment, team leader of the Padova INFN group involved in the ICARUS experiment. **C. Montanari**, Researcher, Technical coordinator for ICARUS-SBN project, CERN fellow associate. **G.L. Raselli**, Researcher; Coordinator the ICARUS light detection system. **D. Gibin**, Associate Professor at the DFA, UNIPD; Member of NNBar2, NOMAD, HARP, ICARUS and DUNE; experience in particle/neutrino physics, detector design exploitation and simulation, data analysis; coordinator of the ICARUS simulation and reconstruction group; member of the ICARUS editorial board; convener of the joint SBN analysis group; convener of the SBN oscillation group. **M. Fiorini**, Ass. Prof. at the Dep. of Physics of the University of Ferrara; Coordinator of the LHCb group of INFN-FE, member of the Na62 Collaboration; Principal Investigator of the 4DPHOTON ERC Consolidator 2018 European Project; Principal Investigator of the INFN-funded AEQUO experiment. **R. De Vita**, Researcher; spokesperson of the CLAS Collaboration **M. Battaglieri**, Researcher; PI of the BDX experiment, PI of the streaming RO EIC R&D project, member of the HPS Collaboration. **G. Urcioli**, Researcher; co-spokesperson of the PREX experiment; co-spokesperson of the Hyperon experiment E12-15-008. 8. **M. Contalbrigo**, Researcher; Coordinator of the INFN activity at JLab; co-spokeperson of the nucleon 3D experiment C11-111; responsible of the CLAS12 RICH project. M. **Statera**, Research Engineer, coordinator of the high-temperature magnet system of CLAS12 target.
Key Research Facilities, Infrastructure and Equipment	INFN has 20 divisions and 11 connected groups based at different university physics departments and four National Laboratories, housing large equipment and infrastructures. In the departments and laboratories participating to this project, there are mechanical and electronic workshops, clean rooms and computing centers. INFN and CNRS have built and operate the Virgo 3-km long interferometer located near Pisa to detect gravitational radiation produced by supernovae and coalescence of binary systems in the milky way and in outer galaxies.
Status of Research Premises	All INFN departments participating to the project are independent research premises.
Previous Involvement in Research and Training Programmes	INFN significantly contributed to the most important experiments in particle physics. A non-exhaustive list is: UA1, UA2, LEP experiments, CDF, NA48, NNBar, KLOE, Nomad, HARP, ICARUS and BABAR. INFN has been involved in 60 R&I projects in FP7.
Current Involvement in Research and Training Programmes	INFN is involved in leading edge HEP experiments in the energy frontier and in high precision measurements: Mu2e and Muon (g-2) at FNAL, LHC experiments at CERN, BESIII, Belle2, MEG, NA62. INFN is also involved in astroparticle experiments: AMS, FERMI, DAMA, ICARUS, OPERA, and VIRGO. INFN is involved in 27 FP7 and 53 H2020 (6 ERC, 17 MSCA, 7 FET, 23 RI) projects. In H2020 the total INFN financial support is above 32 million euro.
Relevant Publications and/or Research / Innovation Product	**[1]** J. Budagov et al., "The Calorimeter Project for the Mu2e Experiment", NIM. A 718 (2013) 56. **[2]** S. Amerio et al (ICARUS Collaboration), "Design, construction and tests of the ICARUS T600 detector", NIM A527 (2004) 329. **[3]** M. Antonello et al (ICARUS Collaboration), "Experimental search for the 'LSND anomaly' with the ICARUS detector in the CNGS neutrino beam" EPJ C73 (2013) no.3, 2345. [**4**] B.A. Mecking et al., "The CEBAF Large Acceptance Spectrometer (CLAS)", NIM A503 (2003) 513. [**5**] P.H. Adrian et al. (HPS Collaboration), "Search for a dark photon in electroproduced e+e− pairs with the Heavy Photon Search experiment at JLab", Phys. Rev. D98 (2018) no.9, 091101.

Beneficiary Legal Name: Costruzione Apparecchiature Elettroniche Nucleari (CAEN)	
General Description	Electronic instrumentation for nuclear and particle physics.
Role and Commitment of key persons (including supervisors)	**Giovanni Di Maio,** head after sales division. **Ferdinando Giordano,** physicist, project manager. **Alessandro Iovene,** engineer, project manager. **Andrea Tesa,** engineer, design and test division.
Key Research Facilities, Infrastructure and Equipment	R&D, Production and Test facilities for electronic systems with more than 30 full-time employees in R&D, Project Management division. Worldwide sales network: - CAEN offices in Italy, Germany and USA - Distributors in more than 30 countries
Status of Research Premises	CAEN owns its research laboratories located at its headquarter.
Previous Involvement in Research and Training Programmes	MODES_SNM - MOdular DEtection System for Special Nuclear Materials, Funded by European Commission under the 7th Framework Programme (FP7) / Cooperation - Theme: SECURITY TAWARA_RTM – TAp WAter RAdioactivity Real Time Monitor, Funded by European Commission under the 7th Framework Programme (FP7) / Cooperation - Theme: SECURITY FTK – Fast Tracker for Hadron Collider Experiments, Funded by European Commission under the 7th Framework Programme (FP7) / Cooperation - Theme: PEOPLE-IAPP
Current Involvement in Research and Training Programmes	JENNIFER – Japan and Europe Network for Neutrino and Intensity Frontier Experimental Research, Funded by European Commission under the Horizon 2020 Programme (H2020) / Excellent Science - Theme: MSCA-RISE C-BORD – effective Container inspection at BORDer control points, Funded by European Commission under the Horizon 2020 Programme (H2020) / Societal Challenges - Theme: BES MUSE – Muon campus in US and Europe contribution, Funded by European Commission under the Horizon 2020 Programme (H2020) / Excellent Science - Theme: MSCA-RISE NEOLITE – Nuove tEcnologie elettrOniche di aLimentazione In ambienTe ostilE, Funded by Regione Toscana under the local regional program of research and innovation POR FESR 2014-2020 PRIMIS – PredIctive MaIntenance in hostile environment, Funded by Regione Toscana under the local regional program of research and innovation POR FESR 2014-2020 INTENSE - Particle physics experiments at the high intensity frontier, from new physics to spin-offs. A cooperative Europe – United States – Japan effort, Funded by European Commission under the Horizon 2020 Programme (H2020) / Excellent Science - Theme: MSCA-RISE
Relevant Publications and/or Research / Innovation Product	**[1]** D.Cester, D. Fabris, M. Lunardon, S. Moretto, G. Nebbia, S. Pesente, L. Stevanato, G. Viesti, F. Neri, S. Petrucci, S. Selmi, C. Tintori: An Integrated mobile system for port security, ANIMMA Conference 2011, Ghent, 5.06. **[2]** D. Cester, G. Nebbia, L. Stevanato, G Viesti, F. Neri, S. Petrucci, S. Selmi, C. Tintori, P. Peerani, A. Tomanin: Special nuclear material detection with a mobile multi-detector system, Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, Volume 663, Issue 1, 21 January 2012, Pages 55-63. **[3]** G Viesti, D. Cester, G. Nebbia, L. Stevanato, F. Neri, S. Petrucci, S. Selmi, C. Tintori, P. Peerani, A. Tomanin: Special Nuclear Material detection studies with the SMANDRA mobile system, IX LASNPA Conference, Quito 2011. **[4]** D. Cester, L. Swiderski, M. Moszynski, A. Iovene, S. Petrucci, C. Tintori: Development of a Mobile Modular System for the Detection of Special Nuclear Material (MODES_SNM). X LASNPA. 040. 1. 2014. **[5]** C. Fontana, M. Donati, D. Cester, L. Fanucci, A. Iovene, L. Swiderski, S. Moretto, M. Moszynski, A. Olejnik, A. Ruiu, L. Stevanato, T. Batsch, C. Tintori, M. Lunardon: A Distributed Data Acquisition System for the Sensor Network of the TAWARA_RTM Project. Physics Procedia. 90. 271-278. 10.1016/j.phpro.2017.09.008. 2017.

Beneficiary Legal Name: Clever Operation (CLEVER)	
General Description	CLEVER is an innovative start-up based in Orsay (France) at the RIC (research intensive cluster) & business cluster of PARIS-SACLAY (targeted French "Silicon Valley"). It is incubated by the 1st technological business incubator in France, IncubAlliance in partnership with CEA, CNRS, BPI France. CLEVER promotes its products and services of customized HW/SW instrumentation of smart-connected sensors and systems with innovative displays and control technologies for different sectors such as nuclear-radiological control and research.
Role and Commitment of key persons (including supervisors)	**Radia SIA**, Ph.D. in High Energy Physics (HEP) instrumentation, New York USA and ICTP-graduate diploma in HEP from the International Center for Physics, Trieste ITALY. Founding partner of CLEVER and its lead scientist. Previously in charge of nuclear measurement instrumentation R&D at AREVA (Paris). 8 years of experience in R&D management/coordination and scientific leadership of projects such as for NSF, DOE, DHS, DoD, DTRA, NASA and NIH. 15 years of R&D for radiation detection instrumentation within leading-edge institutions such as: Radiation Monitoring Devices (RMD) Inc. (a Dynasil company), leader of the US Small Business Innovation Research program, Syracuse Univ. (NY) with FNAL (Chicago, IL), Cornell Wilson Lab (Ithaca NY) and CERN (Switzerland). **Nabil MENAA**, Ph.D. in High Energy Physics. Product & Marketing Director at Canberra Industries (world leader in nuclear instrumentation). Co-Founder of CLEVER and member of its advisory board. Technology Director at Canberra since 2012 and the EDUSAFE ITN task leader. **Hervé LEBBOLO,** M.Sc. in Electronics & Instrumentation (1984). Electronics and Instrumentation Senior Engineer. He held several positions such as the responsible for the electronics division at LPNHE (France). He was involved in many experiments such as DAMIC, DELPHI, RD1, SPACAL H1 Desy, BABAr, D0. **Dj (Djamel-Eddine) SIA (30%)**, **R&D Software Engineer** B.Sc. in Computer Science from the University of Massachusetts Boston, USA (Dean's List and the Academic Council award for outstanding scholars). Ex-R&D Software Developer at Brigham and Women's Hospital and Harvard University (nrims.harvard.edu), also at the Visual Attention Lab of UMASS Boston, and at FracGeo, WoodLands TX. **R&D Software Engineer**, M.Sc. in Computer Science and Ph.D. Candidate. Strong experience in design and development of new DAQ software for radiation detection system prototyping.
Key Research Facilities, Infrastructure and Equipment	CLEVER participates to the software development part of the DAQ system. The company utilizes through its business incubation by the 1st technological incubator in France its facilities (offices, laboratories, servers…). As located on the technological plateau of Paris-Saclay (research intensive & business cluster), it has also privileged access to the partners facilities CEA, CNRS, Paris-Sud, Evry as well as Saint-Quentin Universities.
Status of Research Premises	The Technology department participating in the DAQ software development of the project operates at CLEVER OPERATION independent research premises located at IncubAlliance.
Previous Involvement in Research and Training Programmes	Development of: novel data acquisition (DAQ) system and readout electronics for Fermi National Laboratory (Chicago IL); novel high-resolution imaging system with DAQ, Digital Pixel Sensor readout electronics matched pixel by pixel to highly pixelated CdZnTe sensor; novel in-situ measurement system using portable HP-Germanium for field samples assay ; novel gamma/neutron/x-ray detectors using innovative scintillators and solid-state detector technologies: CMOS-SiPM, CLYC/SrI2/LaBr3/CeBr3… ; Stand-Off Radiation Detection System for HomeLand Security, a collaborative effort between Raytheon IDS, RMD, BTI, MIT and the Univ. of Michigan.
Current Involvement in Research and Training Programmes	NEWS – New Windows on the universe and technological advancements from trilateral EU-US-Japan collaboration, (H2020-MSCA-RISE-2016, GA 734303).
Relevant Publications and/or Research / Innovation Product	**[1]** R. Sia, "Performance of the LiF-TEA ring imaging Cherenkov detector at CLEO," Nuclear Instruments and Methods in Physics Research A 553, 1-2, (2005) 323-327. **[2]** M. Artuso *et al.,* "Performance of a C4F8O gas radiator Ring Imaging Cherenkov Detector using Multi-Anode Photo Multiplier Tubes," Nuclear Instruments and Methods in Physics Research A 558, 2 (2006) 373-387. **[3]** R. Sia *et al.,* "Front End Electronics and Readout System For a Gas Radiator Ring Imaging Cherenkov Detector Using Multi-anode Photomultiplier Tubes," IEEE NSS-MIC Nuclear Science Symposium Conference Record, San Juan, Puerto Rico, Oct. 2005. **[4]** Radia Sia *et al.,* "Solid-State Photon-Counting Hybrid Detector Array for High-Resolution Multi-Energy X-ray Imaging," Nuclear Instruments and Methods in Physics Research A 652, 1 (2011) 470-473. **[5]** R. Sia *et al.,* "Neutron Detectors Based on CMOS Solid State PhotoMultipliers," Proc. SPIE, Vol. 7080, 70800G (2008).

Beneficiary Legal Name: Paul Scherrer Institute (PSI)	
General Description	PSI is the largest national research facility of Switzerland. One of its key missions is to host large scale research infrastructure for Swiss and international users. As such it operates the highest-power proton accelerator (HIPA) in the world that serves four target stations for secondary particles such as muons, pions and neutrons. Additionally, it hosts the Swiss Light Source SLS, the free-electron laser SwissFEL and a small proton cyclotron for proton therapy.
Role and Profile of key people	**A. Knecht,** senior scientist, PSI; spokesperson of the international muX collaboration; member of the Mu3e collaboration; responsible for the piE5 beam line; coordinator of the HiMB project at PSI. **S. Ritt,** senior scientist, PSI; group leader of muon physics at PSI; co-spokesperson of the Mu3e collaboration; member of the MEG-II collaboration. **M. Hildebrandt,** senior scientist, PSI; group leader of detector development at PSI; member of the MEG-II and Mu3e collaborations.
Key Research Facilities, Infrastructure and Equipment	The key facility of PSI for this project are its muon beams that can deliver over 10^8 muons/s to experiments. As a large research facility it also offers access to a large variety of support groups, workshops and equipment.
Independent research premises?	The research facilities are owned by PSI and are independent from the other partners.
Previous Involvement in Research and innovation actions	Listed here is only the involvement of the particle physics laboratory of PSI. As a whole, PSI, is involved in considerably more projects: - MC-PAD (2008-2012, FP7-PEOPLE-2007-1-1-ITN) - PSI-FELLOW (2012-2017, FP7-PEOPLE-2011-COFUND) - HiggsTools (2014-2017, FP7-PEOPLE-2012-ITN)
Current involvement in Research and Innovation actions	Listed here are only the involvement of the particle physics laboratory of PSI. As a whole, PSI, is involved in considerably more projects: - SINE2020 (2015-2019, H2020-INFRADEV-1-2014-1) - PSI-FELLOW-II-3i (2016-2021, H2020-MSCA-COFUND-2015) - HyperMu (2017-2022, ERC-2016-COG)
Publications and/or research/innovation products	**[1]** Bellgardt et al., "Search for the decay $\mu^+ \rightarrow e^+ e^+ e^-$", Nucl. Phys. B **299**, 1 (1988). **[2]** Bertl. Et al., "Search for μ – e conversion in muonic gold", Eur. Phys. J. C **47**, 337 (2006). **[3]** Baldini et al., "Search for the lepton flavor violating decay $\mu^+ \rightarrow e^+ \gamma$ with the full dataset of the MEG experiment", Eur. Phys. J. C **76**, 434 (2016).

Beneficiary Legal Name: SEEMS P. C. (SEEMS)	
General description	Seems P.C. is a high-tech start-up, focusing on the development of Internet of Things solutions employing artificial intelligence and machine learning technologies. SEEMS is built on a team of inspired and hardworking innovation explorers, developing progressive technological solutions to facilitate the quality of the daily life.
Key Persons and Expertise	**P. Soukoulias,** MSc in Computer Science; Experience in multinational project management/coordination; National representative in NATO ICT agency (3 years); Participation in 31 R&D projects, acting as coordinator and/or scientist in charge in 9 large-scale applied research and development projects (CERN/ESA) at European and national level in the Space/Defense/Industry sector. **P. Kouris,** Electrical and Computer Engineer, MSc in Advanced Engineering and in Mechatronics; Experience in Internet of Things Solutions, design of hardware, embedded software, web applications, IoT protocols, communication protocols, machine learning, statistics and bioinformatics. Leading role in more than 15 R&D projects. **A. Soukoulia,** Production and Management Engineer, Master in Business Administration; Experience in Quality Management Systems; Experience in ISO 9001, 27001, 20000 and ESA standards; Participation in 18 European and National projects. **Pn. Soukoulias,** Software developer; Experience in web applications and computer networks; Experience in wireless networks, databases, cloud computing, grid computing, semantics technologies, distributed systems, networking visualization, network security and data privacy.
Key Research Facilities, Infrastructure and Equipment	SEEMS researchers have a rich working profile with significant scientific experience in the development of integrated solutions (hardware and software) and a strong engagement in R&D efforts in Greece and Europe. Possessing an extensive experience on IoT technology, over the last years, SEEMS engineers are mastering the power of dynamic monitoring, employing all types/kinds of existing sensors and applying AI techniques to convert raw data into valuable and exploitable information. SEEMS is equipped with the most advanced computing software resources. R&D Sector participating in the project operate at SEEMS independent premises.
Previous and Current Involvement in Research and Training Programmes	SEEMS personnel has been involved in several projects, including MEPS (4-year ESA project) for development of Power Processing Unit for the Hall Effect Thruster Electric Propulsion Subsystem for Small Satellites; EDUSAFE (MSCA-ITN) for the development of Smart Sensors Safety Systems for Remotely Monitoring personnel working in Extreme Environments (CERN Project); FTK (MSCA-IAPP) for the development of an Associative Memory based processor to perform online track reconstruction in the ATLAS silicon detector at LHC; INTELLIREMED (FP7-SME) for the low-cost remote monitoring for in-situ remediation of soil; ICYHEART (FP7-SME) for wireless cardiac monitoring; ALPINE (NSRF 2007-2013) for Environmental Management; ALTITUDE (FP7-SME) for the development of material alternative to Indium Tin Oxide; VALASIA (NSRF 2007-2013) for the development of sensors for quality control of fish farming; WELCOM (NSRF 2007-2013) for the development of sensors for industrial applications; ECOUILDING (NSRF 2007-2013) for the optimization of energy efficient enterprise building. SEEMS personnel is involved in several Horizon 2020 EU projects, including INTELLICONT for the development and manufacturing of intelligent lightweight composite aircraft container; MUSE (RISE 2015) for the development of the Mu2e and Muon (g-2) experiments at FNAL (USA); NEWS (RISE 2016) for the development of the Virgo (Italy), LIGO (USA) and KAGRA (Japan) gravitational wave interferometers, and Mu2e and Muon (g-2) experiments at FNAL (US) and IXPE NASA mission; FINESOL for the assembly of miniaturized PCBs by using low cost hyperfine solder powders; INTENSE (RISE 2018) for the development of the Short Baseline Neutrino Program, andMu2e and at Fermilab and Muography.
Relevant Publications and/or Research / Innovation Product	**[1]** V. Iakovoglou et al., "Innovative use of sensors to collect, analyze and forecast abiotic factors in order to improve productivity", International Conference on Agricultural Engineering: New Technologies for Sustainable Agricultural Production and Food Security (2014).

Beneficiary Legal Name: Georgian Technical University (GTU)	
General Description	Georgian Technical University (GTU) is one of the biggest educational and scientific institution in Georgia and Caucasus region. GTU has been founded in 1917, became full member of European University Association EUA, and joined Bologna process in 2005. GTU has 12 faculties (covering Engineering, Technology, Natural sciences and Humanities) and 17 affiliated Scientific-Research Institutes. GTU scientific teams are actively involved on LHC experiments at CERN and at COMET experiment at J-Park, Japan.
Role and Commitment of key persons (including supervisors)	**D. Lomidze -** Deputy executive director at Technological Institute of Georgia. Head of Experimental Physics Laboratory at GTU. GTU team leader at COMET experiment. Coordinator of Cosmic Ray Veto system of the COMET experiment. Coordinator of work package CMS-2016-01 at CMS (LHC, CERN). Member of CMS (CERN), COMET (J-Park) and NA62 (CERN) collaborations. **A. Khvedelidze -** Director at Institute of Quantum Physics and Engineering Technologies, Georgian Technical University. Leading researcher of Laboratory of Information Technologies, Joint Institute for Nuclear Research (JINR). Member of CMS (CERN) and COMET (J-PARC). **Z. Tsamalaidze -** Deputy director, Institute of Quantum Physics and Engineering Technologies, Georgian Technical University. Head of a separate scientific sector at Joint Institute for Nuclear Research (JINR). Member of CMS (CERN), COMET, E05, E10, E13, E19, E27, E40 (at J-PARC). Georgian representative in the CMS, CMS Collaboration Board (CB) member. Project leader from JINR to COMET. Member of COMET Collaboration Board (CB). **A. Prangishvili -** Academician, Professor, Rector of GTU. Member of Georgian Academy of Science. Member of European Academy Science and Arts. Member of UN international informatization academy. Plenipotentiary of Georgia at Financial Board of JINR. **Z. Gasitashvili -** Deputy rector in science at GTU. Head of science department at GTU. Member of Engineering National Academy. Member of International Academy of Engineering. **I. Bagaturia -** Associated Professor. Expert of high energy and nuclear physics detectors. Member of CMS and COMET experiments.
Key Research Facilities, Infrastructure and Equipment	GTU has 17 affiliated scientific-research institutions and 51 scientific research centers are successfully performing various scientific and engineering activities. Among them are dedicated laboratories for CMS and COMET experiments.
Status of Research Premises	All GTU departments participating to the project are independent research premises.
Previous Involvement in Research and Training Programmes	The GTU High Energy Physics and Nuclear Physics Group have a strong tradition of international collaborations and student involvement in world-leading research.
Current Involvement in Research and Training Programmes	GTU is involved in frontiers of high-energy physics experiments at LHC, CERN - CMS and ATLAS also, in to Coherent Muon to Electron Transition (COMET) experiment at J-Park, Japan. GTU team is aiming to build a Cosmic Ray Veto system for the COMET experiment which will have impressive muon counting efficiency >= 99.99%.
Relevant Publications and/or Research / Innovation Product	**[1]** G. Adamov, et al., COMET Phase-I Technical Design Report, arXiv:1812.09018. **[2]** CMS Collaboration, Observation of a new boson with a mass near 125 GeV, 10.1007 / JHEP06(2013) 081. **[3]** A. M. Sirunyan et al, Observation of Higgs boson decay to bottom quarks, 10.1103/PhysRevLett.121.121801. **[4]** D. Lomidze, et. all, (NA62 collaboration), First search for the K+ to pi+ nu nubar decay using the decay-in-flight technique, Phys. Lett. B 791 (2019) 156-166. **[5]** Tsanamalaidze et at, Observation of the diphoton decay of the Higgs boson and measurement of its properties, Eur.Phys.J. C74 (2014) no.10, 3076. **[6]** Tsamalaidze et al, Observation of the rare $B0s \to \mu+\mu-$ decay from the combined analysis of CMS and LHCb data

Beneficiary Legal Name: Imperial College of Science, Technology and Medicine (Imperial College London, IMC)	
General Description	Imperial College London is a university which focuses on the four main disciplines of science, engineering, medicine and business with an international reputation for world class education and for excellence in research. Imperial College London has been ranked the 8th best university in the world, according to the Times Higher Education league table and QS World University Rankings as of 2019. There are approximately 8,000 staff in total and 17,000 students. 14 Nobel Laureates have been members of the College either as staff or students. Imperial holds a Silver Athena Swan award, which recognises advancing women's careers in science, technology, engineering, maths and medicine in academia. The Department of Physics is one of the largest in the UK, with about 900 undergraduate and 400 postgraduate students. The High Energy Physics Group, at over 140 people, is one of the largest in the UK.
Role and Commitment of key persons (including supervisors)	**Y. Uchida**, Professor of Physics, also Guest Professor at Osaka University; Member of COMET, T2K, Super-K and Hyper-K, and previously KamLAND and L3. Chair of the Collaboration Board and Physics Analysis and Software Working Group convener for COMET. Chair of the Publications Board and ND280 Software Working Group convener and Institutional Board representative for T2K. Co-Chair of the Rencontres du Vietnam Flavour Physics conference series. Supervisor of PhD students on COMET. **D. Colling**, Professor of Physics and e-Science; Member of COMET, CMS, MICE, and previously ALEPH. Technical Director of the GridPP computing collaboration between the UK and CERN. Head of GridPP computing at Imperial and the UK, and UK CMS Computing. **J. Pasternak**, Senior Lecturer in Accelerator Physics; Member of COMET, T2K, MICE, DUNE and nuSTORM. Chair of the PRISM Task Force on FFAG accelerator-based muon physics. **P. Litchfield**, Visiting academic and Lecturer in Particle Physics at the University of Glasgow. Member of COMET, T2K, Super-K and Hyper-K, and previously MINOS. Collaboration Board representative on COMET for Imperial College. **P. Jonsson**, Senior Instrument Manager; Member of COMET, T2K and Hyper-K, and previously DZero, OPERA and DELPHI. Chair of the COMET Analysis and Software meetings, and T2K ND280 Calibration Working Group convener. **A. Rose**, Electrical Engineer; Member of CMS. Co-designer of the FP7 data-acquisition and control card used by COMET, and the widely-used MP7 and Serenity high-performance data stream processors.
Key Research Facilities, Infrastructure and Equipment	The main Imperial College campus is situated in South Kensington in London, UK, and this is where the development facilities for the Department of Physics are located. Most development work is carried out by on-site teams of engineers and technicians, jointly with academics, researchers and students. This makes use of significant electronic and mechanical laboratories and workshops, and a major high-performance computing centre. The core computing facility is in the process of being relocated to the west of London, but the user-base will remain at South Kensington. The High Energy Physics Group has long-standing working relationships with international particle physics laboratories such as CERN, KEK, J-PARC and Fermilab.
Status of Research Premises	Research facilities are independently run and belong to Imperial College London.
Previous Involvement in Research and Training Programmes	The Imperial College High Energy Physics Group has a strong tradition of student involvement in world-leading research, from the discovery of nuclear pion capture by then-PhD student D. Perkins in 1947 to leading roles in the ALEPH Experiment at the Large Electron-Positron collider in the 1990s. Other major past experiments include ZEUS, BaBar, UA1, DZero, CALICE, TASSO, BEATRICE and ZEPLIN. Each of these has produced important research outputs as well as providing a training ground for numerous PhD, Masters and undergraduate students and more senior researchers.
Current Involvement in Research and Training Programmes	Current experiments in which Imperial has significant involvement include COMET, CMS, LHCb, T2K, LUX/ZEPLIN, MICE, PAMELA, SHiP, Super-Kamiokande, Hyper-Kamiokande, SuperNEMO, and DUNE. Roughly 40 PhD students are currently working within the group, alongside a similar number of postdocs and fellows.
Relevant Publications and/or Research / Innovation Product	**[1]** *COMET Phase-I Technical Design Report*, COMET Collaboration, arXiv:1812.0901 (to be published), **[2]** *Precise Measurement of the Neutrino Mixing Parameter \theta_{23} from Muon Neutrino Disappearance in an Off-Axis Beam* T2K Collaboration, Phys.Rev.Lett. 112 (2014) no.18, 181801, **[3]** *First particle-by-particle measurement of emittance in the Muon Ionization Cooling Experiment* MICE Collaboration, RAL-P-2018-005, arXiv:1810.13324, **[4]** *The MP7 and CTP-6: multi-hundred Gbps processing boards for calorimeter trigger upgrades at CMS* A. Rose et al, 2012 JINST 7 C12024, **[5]** *Observation of the Higgs boson decay to a pair of τ leptons with the CMS detector* CMS Collaboration, Phys.Lett. B779 (2018) 283-316

Beneficiary Legal Name: European Organization For Nuclear Research (CERN)	
General Description	CERN is a European research organization that operates the largest particle physics laboratory in the world. CERN's main function is to provide the particle accelerators and other infrastructures needed for high-energy physics research. The laboratory in has ~ 2,500 scientific, technical, and administrative staff members, and hosts 12,000 users annually.
Role and Profile of key people	**M. Nessi**: head of the CERN Neutrino Platform project, which includes the ICARUS overhauling phase for the SBN project, former Technical coordinator of the ATLAS experiment at the LHC- Full professor at the University of Geneva. **F. Pietropaolo**, INFN Senior Researcher, presently at CERN Research Associate, fully involved in the development of the liquid argon TPC technique and in the ICARUS experiment. **P. Sala,** INFN Senior Researcher, now CERN Research Associate, involved in the ICARUS experiment at Gran Sasso and in the next SBN project in particular in the required software developed within the FLUKA framework. **D. Tommasini:** PhD in Electrical Engineering; CERN researcher, experience of high field superconducting magnets Head of the Normal Conducting Magnets and manager of more than 5000 magnets at CERN since 2008; Responsible of the CERN Magnet Development Program for the FCC, including the 16T dipole R&D in the framework of a large international collaboration.
Key Research Facilities, Infrastructure and Equipment	The Neutrino Platform is CERN's undertaking to foster and contribute to fundamental research in neutrino physics at particle accelerators worldwide, as recommended by the 2013 European Strategy for Particle Physics. It includes the provision of a R&D facility in a newly built test-beam hall on CERN's Prévessin site at CERN to allow the global neutrino community to develop and prototype the next generation of neutrino detectors. It will also support state-of-the-art technologies in the fields of cryogenics, magnets and beam lines, as well as integration and assembly techniques. Two large neutrino detectors, the single- and dual-phase protoDUNE modules are being built at CERN, prototypes of the future Deep Underground Neutrino Experiment (DUNE) detector, the construction of which has recently begun in the United States. Each of these detectors is a 10x10x10-metre Liquid Argon Time Projection Chamber, with a single or dual-phase configuration, containing about 800 tonnes of liquid argon.
Independent research premises?	Research facilities are owned by CERN and independent from other beneficiaries/partner organization in the consortium.
Previous Involvement in Research and innovation actions	Several important achievements in particle physics have been made through experiments at CERN. They include among several others 1973: The discovery of neutral currents in the Gargamelle bubble chamber; 1983: The discovery of W and Z bosons in the UA1 and UA2 experiments; 2012: The long-sought Higgs boson was CERN is also the birthplace of the World Wide Web. More recently, CERN has become a facility for the development of grid computing, hosting projects including the Enabling Grids for E-sciencE (EGEE) and LHC Computing Grid. 37 patents in the CERN portfolio at the end of 2009 • An average of 3.7 new patents per year; • 51% of the patents are related to the LHC program; • 22% are in co-ownership (academia, industry: filed as a result of partnerships).
Current involvement in Research and Innovation actions	The LHC program has fostered a rich variety of technologies and know-how with 50% transfer of the technology portfolio being exploited. CERN, in collaboration with groups worldwide, is investigating two main concepts for future accelerators: A linear electron-positron collider with a new acceleration concept to increase the energy (CLIC) and a larger version of the LHC, a project currently named Future Circular Collider. CERN OpenLab is a collaboration between CERN and several industrial partners to develop new knowledge in Information and Communication Technologies through the evaluation of advanced solutions and joint research to be used by the worldwide community of scientists.
Publications and/or research/innovation products	**[1]** G. Aielli et al. Phys. Lett. B 716 (2012) 1; **[2]** G. Aielli et al. Phys.Rev. Lett. 110 (2013) 011802; **[3]** M. Antonova et al., JINST 12 (2017) C07028; **[4]** T. Cervi et al., JINST 12 (2017) no.03, C03007; **[3]** M. Antonello et al., JINST 12 (2017) P0401,

Beneficiary Legal Name: Tel Aviv University (TAU)	
General Description	TAU is one of the leading universities in Israel with over 30,000 students. TAU is the center of teaching and research of Tel Aviv, comprising 9 faculties, 17 teaching hospitals, 18 performing arts centers, 27 schools, 106 departments, 340 research centers and 400 laboratories.
Role and Profile of key people	**E. Piasetkzy**, Prof. of Physics at TAU and incumbent of the Wolfson chair in experimental physics. Member of the nuclear physics board of directors of the European physical society 2011-2017, and elected fellow of the American Physical Society. Spokesperson and participate in experiments at PSI, CERN, SLAC, LAMPF, TRIUMF, BNL, JLAB, FNAL, Dubna, GSI, MAINZ. **G. Laskaris**, Postdoctoral associate at MIT and TAU. Expert in polarized targets, detector development, analysis and simulations. **E. O. Cohen**, Senior graduate student at TAU. Expert in electron and neutrino-nucleus interactions. Spokesperson of an experiment at JLAB. **S. Lupu**, Senior graduate student at TAU. Expert in Machine learning. **D. Vidne**, Electronic engineer at TAU. Expert in fast electronics design and detector development.
Key Research Facilities, Infrastructure and Equipment	The nuclear physics group at the school of physics and astronomy has a state-of-the-art laboratory for detector development and testing, and computer resources for calculations, analyses, and simulations.
Independent research premises?	The research facilities are owned by TAU.
Previous Involvement in Research and innovation actions	The TAU experimental group has developed the large-acceptance detectors for experiments at Jefferson Lab (Big-Bite and HAND). The TAU group has also developed a multi-foil target system for polarization transfer measurements at MAINZ.
Current involvement in Research and Innovation actions	The TAU group is developing a SiPM-based beam hodoscope for the MUSE experiment at PSI, and a pair-spectrometer for measurements at Dubna. We are also currently developing two neutron detectors for experiments at JLAB: LAND and BAND. We are involved in the MicroBooNE experiment at FNAL, the MUSE experiment at PSI, a few projects at Jefferson Lab and MAINZ, and research projects utilizing high-energy hadron facilities in Europe (GSI and Dubna).
Publications and/or research/innovation products	[**1]** Evidence for the strong dominance of proton-neutron correlations in nuclei, E.Piasetrzky,M.Sargsian, L. Frankfurt, M. Strikman, and J. W. Watson Phys. Rev. Lett. 97, 162504 (2006). [**2]** Probing Cold Dense Nuclear Matter, with R. Subedi et al., Science 320, 1426 (2008). **[3]** Momentum sharing in imbalanced Fermi systems, O. Hen et al., Science 346, 614 (2014).

Beneficiary Legal Name: University of Bern (UNIBE)	
General Description	The University of Bern is one of the top ranked international universities in the world. With nearly 18000 students, is a mid-size institution with 8 faculties, more than 350 professors and a yearly budget of about exceeding 700 million CHF. UNIBE has several excellence centers with special status, One of those is the Albert Einstein Center for Fundamental Physics (AEC), to which all Bern researchers involved in this project are affiliated.
Role and Profile of key people	**Michele Weber** is associate professor of physics. His main fields of expertise include collider physics (ATLAS experiment at the LHC) and neutrino physics (SBN project in particular, with key management roles). The Bern group is complemented by several post docs and PhD students involved in the subjects of this proposal. **Antonio Ereditato** is full professor for experimental particle physics, director of LHEP and of the AEC. He is a recognized expert of neutrino physics with more that 1000 scientific publications. Member of international committees of funding agencies, of scientific evaluation panels and of international conferences. Supervisor of more than 50 Master and PhD students. **Igor Kreslo** is associate professor of physics, with an outstanding track record in detector development. His expertise covers most of particle detectors features: tracking, cryogenics, calorimeters, photo-devices, electronics, readout and DAQ. **Michele Weber** is associate professor of physics. His main fields of expertise include collider physics (ATLAS experiment at the LHC) and neutrino physics (SBN project in particular, with key management roles). The Bern group is complemented by several post docs and PhD students involved in the subjects of this proposal.
Key Research Facilities, Infrastructure and Equipment	The Bern group has in house large infrastructure: cryogenic labs, detector assembly halls, electronics workshop, mechanical workshop, IT computing center (ATLAS Tier2). This is supported by engineers and technicians with an outstanding track record.
Independent research premises?	All the above mentioned infrastructure belongs to LHEP-AEC.
Previous Involvement in Research and innovation actions	In recent years, we have been leading efforts on the OPERA experiment and in the XENON project. In past years also on the UA2 experiment at the CERN spsc collider. Our people have been awarded for this many third party funding grants (e.g. from the Swiss SNSF and from EU).
Current involvement in Research and Innovation actions	The Bern group is presently involved in the ATLAS experiment at the CERN LHC, on the SBN program at FNAL, on the DUNE project at FNAL, on the T2K experiment at J-PARC. We are also active in the filed of medical physics at the Bern hospital cyclotron, on cosmic-muon physics, on antimatter experiments, on ultracold neutron physics, and on R&D studies of novel particle detectors.
Publications and/or research/innovation products	**[1]** A. Ereditato et al. "Measurement of muon antineutrino oscillations with an accelerator-produced off-axis beam", Phys. Rev. Lett. 116 (18), p. 181801 (2016). **[2]** A. Ereditato et a. "Measurement of the muon neutrino inclusive charged current cross section in the energy range of 1-3 GeV with the T2K INGRID detector", Phys. Rev. D 93(7) p.72002 (2016). **[3]** A. Ereditato "The discovery of the appearance of muon neutrino – tau neutrino oscillations" Nuclear Physics B, 908, pp. 116-129 (2016). **[4]** A. Ereditato et al. "Discovery of tau neutrino appearance in the CNGS neutrino beam with the OPERA experiment", Phys. Rev. Lett. 115(12), p. 121802 (2015). **[5]** A. Ereditato et al. "The Opera experiment", Nuclear and Particle Physics Proceedings, 267-269, pp. 87-93 (2015).

Beneficiary Legal Name: Institute of Nuclear and Particle Physics (Technische Universität Dresden, TUD)	
General Description	The Technische Universität Dresden (TUD) is one of the largest "Technische Universitäten" in Germany and one of the leading and most dynamic universities in Germany, certified with the name "Excellence University". The Institute of Nuclear and Particle Physics at TU Dresden conducts basic research in the field of experimental and theoretical elementary particle physics, on the structure and formation of our universe as well as on interactions between its smallest constituents. Furthermore, it comprises 7 working groups with a total of more than 80 employees and students. In addition, there are close co-operations with the Helmholtz Center Dresden-Rossendorf (HZDR), the European Research Center CERN and the Gran Sasso Laboratory (LNGS) as well as other national and international research facilities like SNOLAB, GSI/FAIR and TRIUMF.
Role and Profile of key people	**K. Zuber**, Professor of Physics, Member of the COMET, GERDA, LEGEND, SNO+, BOREXINO, DARWIN, R3B, ISOLTRAP and COBRA (he is spokesperson of the latter since 2002) and previously GALLEX, Heidelberg-Moscow, HARP, NOMAD, SNO, H1, Neutron-EDM and AQUA-RICH. Chairman of the 5th Solar Neutrino Conference (Dresden), Co-Chairman of the Capture Gamma Ray Spectroscopy Conference (Dresden) and Co-Chairman of the Weak interactions in Nuclei (WIN) in South Africa. Author of two textbooks (Particle Astrophysics in German, English and Russia) and Neutrino Physics (English) **D. Stöckinger,** Professor of Physics, Member of the COMET and g-2 collaboration
Key Research Facilities, Infrastructure and Equipment	Most of the technical research equipment is directly located in the main building of IKTP in Dresden. There are mechanics and electronics workshops which directly cooperate with academics to enable fast and efficient development work. A central scientific institution of the TU Dresden is the high-performance computing cluster (ZIH). It is located directly on campus and provides access to core computing facilities as well as a team of computing experts. Since 2016, in a joint effort with the HZDR, TU Dresden is building the first underground accelerator facility in Germany at the Felsenkeller underground site. The accelerator will provide intense, 50 μA, beams of $^{1}H^{+}$, $^{4}He^{+}$, and $^{12}C^{+}$ ions, enabling research on astrophysically relevant nuclear reactions with unprecedented sensitivity. Furthermore long-living alpha-half-life measurements and beta decay spectral shapes can be measured.
Independent research premises?	Various research facilities like a high-intensity 14 MeV DT-generator, low background gamma spectroscopy detectors and an Underground Accelerator (in cooperation with HZDR) belong to TU Dresden.
Previous Involvement in Research and innovation actions	Traditionally the group at TU Dresden is involved in many world leading particle physics experiments. The non-exhaustive list ranges from B-physics and nuclear structure reactions up to neutrino physics. These contributions not only produce important research outputs like the discovery of neutrino oscillations with SNO, awarded with the Nobel price of physics 2015, but also provide a training ground for numerous PhD, Masters and undergraduate students.
Current involvement in Research and Innovation actions	The Institute of Nuclear and particle physics of TU Dresden is involved in various experiments in the area of nuclear, particle and astroparticle physics. Currently these are COMET, GERDA, LEGEND, SNO+, BOREXINO, DARWIN, R3B, ISOLTRAP , SNO, COBRA and ATLAS.
Publications and/or research/innovation products	**[1]** COMET Phase-I Technical Design Report, COMET Collaboration, arXiv:1812.0901 (to be published), **[2]** Results on neutrinoless double beta decay of Ge-76 from phase I of the GERDA experiment, Phys. Rev. Lett. 111 (2013)233504 **[3]** Measurement of the total active B-8 solar neutrino flux at the Sudbury Neutrino Observatory with enhanced neutral current sensitivity, Phys. Rev. Lett. 92 (2004), 181301, **[4]** Comprehensive measurement of pp-chain solar neutrinos, Nature 562 (2018)505, **[5]** Masses of exotic calcium isotopes pin down nuclear force, Nature 498 (2014) 346 **[6]** The electroweak contributions to (g-2) muon after the Higgs boson mass measurement, Phys. Rev. D 88 (2013) 053005, **[7]** The Muon magnetic moment and supersymmetry, J. Phys. G (2007) R45, **[8]** Precise prediction for m(W) in the MSSM, JHEP 0608 (2006) 076, **[9]** Gauge dependence and renormalization of tan beta in the MSSM, Phys. Rev. D 66 (2002) 095014, **[10]** Muon (g-2): Experiment and theory (2012), Ann. Rev. Nucl. Part. Sci. 62, 237

Beneficiary Legal Name: Centre national de la recherche scientifique (CNRS)	
General Description	CNRS is a government-funded research organisation, under the administrative authority of France's Ministry of Research. CNRS's annual budget represents a quarter of French public spending on civilian research. As the largest fundamental research organisation in Europe, CNRS carries out research in all fields of knowledge, through its ten institutes. The National Institute of Nuclear and Particle Physics (IN2P3) of CNRS promotes research in the fields of nuclear physics, particle and astroparticle physics and coordinates programmes within these fields on behalf of CNRS and French universities. IN2P3 runs major national facilities including particle accelerators and supports international facilities (e.g. CERN, EGO/VIRGO).
Role and Profile of key people	**C. Cârloganu**, CNRS senior researcher. Member of COMET Institutional Board (IB). LPC coordinator for the AIDA2020 program. Member of the Steering Committee of France-Japan LIA. PI of the TOMUVOL collaboration, Co-PI of the DIRE collaboration (2018-…). Previously member of ANTARES, LHCb, CALICE and Clervolc Labex Steering Committee (2011). **V. Niess,** CNRS senior researcher, expert in high level data analysis and simulations and in particle and astroparticle physics (ANTARES, LHCb, CKMFitter, TREND/GRAND, TOMUVOL). Lecturer in instrumentation at UCA. **J.-C. Angelique**, University Professor at engineer school ENSICAEN. Member of COMET IB. Radiation Safety officer. Expert in Monte Carlo simulations. **G. Ban,** University Professor at engineer school ENSICAEN. Director of LPC-CAEN research laboratory. Member of COMET and nEDM, expert in data analysis. **G. Quemener**, senior researcher. Member of COMET. Previously member of nEDM. Expert in electric and magnetic fields computing, tracking, simulations and data analysis. **W. da Silva**, senior assistant professor at Sorbonne University. Member of COMET IB. Previously member of DELPHI, ILC Silicon Tracking and LHCb. Expert in high-level data analysis and simulations. **F. Kapusta**, CNRS senior researcher. Member of COMET. Previously member of CELLO, DELPHI, ILC Silicon Tracking and LHCb. Expert in high level data analysis and simulations. **P. Lebrun**, CNRS senior researcher. Previously member of L3 at LEP and D0 at FNAL. Expert in high level data analysis (Higgs searches using its decay into invisible particles, high-precision measurement of the W boson mass), co-convener of the "MC production" and Cal/ICD Software groups in D0. Expert for the D0 liquid argon calorimeter calibration. **S. Niccolai**, Director of Research; head of the high-energy physics groups at IPN Orsay; head of the JLab team at IN2P3; member of CLAS and HPS; member of the Nuclear Physics board of the EPS; spokesperson of the GPD-ACT JRA part of the STRONG-2020 project; spokesperson and run-group coordinator for the experiments on deuterium target with CLAS12; responsible for the Central Neutron Detector of CLAS12.
Key Research Facilities, Infrastructure and Equipment	LPC, LPC-Caen, LPNHE and IP2I are IN2P3/CNRS laboratories, each with more than 100 permanent and numerous non-permanent staff. They have large technical departments (mechanics, mechanical workshops, electronics, micro-electronics, computing) and administrative staff. LPC hosts and ensures maintenance and operation for a Tier-2 of the LHC computing grid and all laboratories are supported by CC-IN2P3 computing centre, acting as COMET data and software centre. IP2I and LPC have the infrastructure (clean rooms, etc) for building and commissioning cutting-edge GRPC detectors employed for COMET CRV.
Independent research premises?	All research premises are independent.
Previous Involvement in Research and innovation actions	IN2P3 took part in numerous FP6, FP7 and H2020 projects (e.g. EGEE-III, EDGES, ILC-HiGrade, EUCARD, AIDA, EUDET), and received 13 ERC awards. IN2P3 research teams are regularly funded through competitive grants from the French research agency "ANR".
Current involvement in Research and Innovation actions	IN2P3 is a key contributor to ATLAS, CMS and LHCb at CERN, including detector upgrades for HL-LHC. It participates to the R&D for ILC, FAIR-CBM, neutrino physics, LSST and CTA observatory. IN2P3 is involved in 13 H2020 ongoing projects (Infrastructures, NFRP and RISE) and coordinates two of them.
Publications and/or research/innovation products	**[1]** COMET Collab, "COMET Phase-I Technical Design Report", arXiv:1812.09018 **[2]** COMET Collab, "A submission to the 2020 update of the European Strategy for Particle Physics on behalf of the COMET collaboration", https://arxiv.org/abs/1812.07824. **[3]** V. Niess et al, "Backward Monte-Carlo applied to muon transport", Comput.Phys.Commun. 229 (2018) 54-67 (2018-08), arXiv:1705.05636.**[4]** CALICE Collab, "First results of the CALICE SDHCAL technological prototype", JINST 11 (2016) no.04, P04001, "First evidence of hard scattering processes in very low Q2 single tagged photon-photon collisions using the DELPHI VSAT detector", Phys.Lett. B342, 402 (1995). **[5]** W.da Silva, F. Kapusta "An analytical expression of the asymptotic QED cross-section of four lepton two-pair production in gamma-gamma collisions", Phys.Lett.B 718 (2012) 577-578

Beneficiary Legal Name: Commissariat à l'énergie atomique et aux énergies alternatives (CEA)	
General Description	CEA is a French public company, involved in the fundamental research as well as in applied research. According to Reuter's ranking, it is the world's most innovative public research organisation. It is a key member of the Paris-Saclay university that will gather the top-ranking French laboratories, engineering schools and the Paris Sud university.
Role and Profile of key people	**Dr. M. Defurne**: Staff scientist and Head of the Jefferson Lab physics group at CEA Saclay since 2015 after a PhD in hadronic physics. Member of Hall A and CLAS12 collaborations of Jefferson Lab. Spokesperson of one Jefferson Lab experiment. Institute representative of CEA for CLAS12 collaboration. Advisor of two PhD students doing CLAS12 data analysis. Teacher in the Nuclei-particle-astrophysics-cosmology master of Paris Saclay university. **Dr. F. Bossu** is staff scientist of Irfu/DPhN at CEA-Saclay since Oct. 2017. He is a member of the CLAS collaboration at Jefferson Lab. In the past, he has been part of ALICE and LHCb experiments at the Large Hadron Collider. He has covered roles of responsibility both on the coordination of analysis working group and on detector activities. **Dr. F. Sabatié**, Head of the CEA Saclay Nuclear Physics Department, spokesperson of 6 Jefferson Lab experiments (Halls A & B)
Key Research Facilities, Infrastructure and Equipment	CEA activities and expertise cover from particle detectors to theory. The electronics and detector division of CEA owns laboratories and equipment with which the Micromegas vertex tracker of CLAS12 spectrometer has been designed and realized. CEA has access to computing grids, allowing to perform massive data analysis and Monte-Carlo simulation. Finally a strong theory group, leader of GPD phenomenology, supports and enhances the experimental activities at Jefferson Lab.
Independent research premises?	The beneficiary organization is wholly independent concerning its research premises.
Previous Involvement in Research and innovation actions	In the past, CEA was involved in HP1, HP2, HP3, FP7 EURONS and ENSAR research programs.
Current involvement in Research and Innovation actions	CEA is involved in many international experimental programs: at CERN (COMPASS, ALICE, ATLAS, etc), at Jefferson Lab in the US, in Japan at RIKEN. It is currently involved in the H2020 ENSAR2 and AIDA 2020 projet IA research programs. Finally it is one of the key members of the Paris-Saclay university.
Publications and/or research/innovation products	[**1**] A glimpse of gluons through deeply virtual Compton scattering, M. Defurne, F. Sabatié et al., Nat. comm. 8, 1408. [**2**] Rosenbluth separation of the pi0 electroproduction cross section, M. Defurne, F. Sabatié et al., Phys. Rev. Lett. 117, 262001. [**3**] The E00-110 experiment in Jefferson Lab's Hall A: Deeply Virtual Compton Scattering off the Proton at 6 GeV, M. Defurne, F. Sabatié et al., Phys.Rev. C92 (2015) no.5, 0552022013. [**4**] PARTONS: PARtonic Tomography Of Nucleon Software: A computing framework for the phenomenology of Generalized Parton Distributions, H. Moutarde, F. Sabatié et al., Eur. Phys. J. C. 78, 478. [**5**] Timelike and spacelike deeply virtual Compton scattering at next-to-leading order – H. Moutarde, B. Pire, F. Sabatié, L. Szymanowski, J.Wagner, PRD87 (2013) 5, 0540292013. [**6**] From hard exclusive meson electroproduction to deeply virtual Compton scattering – P. Kroll, H. Moutarde and F. Sabatié, Eur.Phys.J. C73 (2013) 22782011. [**7**] Measurements of the Lorentz angle with a Micromegas detector in high transverse magnetic fields – P. Konczykowski, F. Sabatié et al., NIM A621, 17.

Beneficiary Legal Name: University of Glasgow (UGLS)	
General Description	Founded in 1451, the University of Glasgow has a tradition of excellence as the UK's fourth oldest university. It is a member of the elite Russell Group of leading UK research universities, a founding member of Universitas21, and of the Guild of European Research-Intensive Universities. UoG has fostered the talents of seven Nobel laureates, Scotland's first female medical graduates, and includes among its alumni, some of the world's most renowned innovators, from scientist Lord Kelvin, economist Adam Smith, to the pioneer of television John Logie Baird. Ranked 69 in the world (QS World Rankings 2019), UoG is a world-leading research-intensive institution, attracting scholars from more than 130 countries worldwide each year. In recognition of employment practices that support the careers of women in science, technology, engineering, mathematics and medicine (STEMM) in higher education, UoG has been awarded an Athena SWAN Institutional Bronze Award as well as the European Commission's 'HR excellence in research' award.
Role and Commitment of key persons (including supervisors)	**D. Ireland**, Professor of Physics; Head of Nuclear Physics Research Group; Director of Research in the School of Physics and Astronomy; Past Chair of CLAS collaboration, Jefferson Lab, US; Chair, International Nuclear Physics Conference 2019; **D. Hamilton** is the co-spokesperson of the experimental proposals E12-09-019, E12-17-004, E12-14-003 and E12-17-008 at JLab Hall A. **R. Montgomery** is an STFC Ernest Rutherford Fellow and is co-spokesperson of experimental proposals E12-06-122, C12-15-006 and C12-15-006A at JLab Hall A. **D. Sokhan** is the co-spokesperson of the experimental proposals E12-11-003 and E12-06-109A at JLab Hall B.
Key Research Facilities, Infrastructure and Equipment	The main University of Glasgow campus is situated in the city of Glasgow, UK, which includes the School of Physics and Astronomy. Most development work is carried out by on-site teams of academics, researchers, technicians and students. The Nuclear and Hadron Physics group has a PC farm for data storage and processing, and testing facilities for the development of new detector systems. It also has long-standing working relationships with international laboratories such as Jefferson Lab, DESY and MAMI in Mainz, Germany
Status of Research Premises	Research facilities are independently run and belong to the University of Glasgow.
Previous Involvement in Research and Training Programmes	The University of Glasgow Nuclear and Hadron Physics Group has been supported by a series of Consolidated Grants from STFC, and was the lead partner in the UK's contribution to the JLab Upgrade project. It has previously been awarded funding from several of the EU Framework programmes, and has a long record of student involvement in the research programmes based at international facilities. All of these has resulted in important research outputs, strong collaborative ties and has provided a training ground for numerous PhD and more senior researchers.
Current Involvement in Research and Training Programmes	The group is currently involved at Jefferson Lab, through the CLAS collaboration, the Hall A/C collaborations (SBS) and GlueX. Another programme is the A2 collaboration at MAMI. Mainz, Germany. There are also links with detector development activities at the European Spallation Source (ESS) in Lund, Sweden. Current support is from the UK's STFC and as a work package leader in a Horizon2020 award.
Relevant Publications and/or Research / Innovation Product	**[1]** *Measurement of the beam spin asymmetry of $e\rightarrow p\rightarrow e' p' \eta$ in the deep-inelastic regime with CLAS*, B Zhao, et al., Physics Letters B 789, 426-431 2019) **[2]** *First Exclusive Measurement of Deeply Virtual Compton Scattering off : Toward the 3D Tomography of Nuclei,* M Hattawy, et al, Physical review letters 119 (20), 202004 (2017) **[3]** *Measurement of two-photon exchange effect by comparing elastic cross sections,* D Rimal, et al., Physical Review C 95 (6), 065201 (2017) **[4]** *Cross sections for the exclusive photon electroproduction on the proton and Generalized Parton Distributions*, HS Jo, et al, Physical Review Letters 115 (21), 212003 (2015) **[5]** *Single and double spin asymmetries for deeply virtual Compton scattering measured with CLAS and a longitudinally polarized proton target,* S Pisano, et al, Physical Review D 91 (5), 052014

Beneficiary Legal Name: Saes Rial Vacuum (SRV)	
General Description	Construction of superconducting magnets and design and construction of UHV setups
Role and Commitment of key persons (including supervisors)	**F. Gangini** project manager, **M. Canetti R&D** engineer, **L. Corradini** quality engineer, **G. Pinotti** workshop manager
Key Research Facilities, Infrastructure and Equipment	R&D, Production and Test facilities for superconducting magnets and UHV setups for accelerators, R&D and industrial production. In house design, precision machining, assembly and quality assurance.
Status of Research Premises	SRV owns its R&D, design, manufacture and QA laboratories.
Previous Involvement in Research and Training Programmes	Production of components for LHC, ESRF and others. Production of the high order corrector prototypes for the HL-LHC prototypes.
Current Involvement in Research and Training Programmes	Construction of the prototypes of the high order correctors for HL-LHC. Series production of 54 high order correctors for HL-LHC, divided into five families from skew quadrupole to dodecapole.
Relevant Publications and/or Research / Innovation Product	[1] Construction and Cold Test of the Superferric Dodecapole High Order Corrector for the LHC High Luminosity Upgrade, IEEE Transactions on Applied Superconductivity (Volume: 29 , Issue: 5 , Aug. 2019)

Partner Organisation Legal Name: Fermi Research Alliance (FRA)	
General description	FRA manages the Fermi National Accelerator Laboratory (FNAL) for the US Department of Energy Office of Science. FNAL was founded in 1967 and sits on a 6800 acre campus just outside Chicago, Illinois. FNAL is America's premier particle physics laboratory. Collaborating with thousands of scientists from around the world, FNAL performs pioneering research at the frontiers of discovery.
Key Persons and Expertise	**E. Barzi**, APS Fellow, FNAL Scientist, leader of superconductor strand and cable R&D at Fermilab, coordinator of superconductor R&D US Interlab Program. **B. Casey**, FNAL Scientist, Head of the Particle Physics Division's Muon Department, which hosts the g-2 and Mu2e experiments, L2 manager for the g-2 detector upgrades, member of the D0 Collaboration. **D. Glenzinski**, APS Fellow, FNAL Scientist, Deputy Head of the PPD Muon Department, Mu2e Collaboration spokesperson, member of the CDF Collaboration. **R. Ray**, FNAL Scientist, Project Manager for the Mu2e experiment. **J. Whitmore**, FNAL Scientist, Deputy Project Manager for the Mu2e experiment. **A. Lyon**, FNAL Scientist, Associate Division Head for System for Scientific Applications. **A. Fava**, Associated Scientist, Wilson Fellow, Neutrino Division. **F. Cavanna**, FNAL Scientist, co-coordinator of the ProtoDUNE experiment. **O. Palamara**, FNAL Scientist, Neutrino Division deputy Group. **G. Stancari**, FNAL Scientist, Head of the Accelerator Research Department; Co-PI of a FNAL Laboratory-Directed Research and Development (LDRD) grant on quantum effects in undulator radiation, and the physics and technology of electron lenses
Key Research Facilities, Infrastructure and Equipment	FNAL consists of 8 Divisions and Sections that maintain and operate world-class laboratory, accelerator, and computing facilities. The FNAL accelerator complex is one of the most sophisticated in the world and currently provides beam to several experiments and test beam facilities including MINOS+, NOvA, MINERvA, MicroBooNE, SBND, and ICARUS. The complex is currently being upgraded to provide beam to the Muon (g-2) and Mu2e experiments. All the FNAL Divisions are independent research premises, including the Particle Physics Division, which hosts the neutrino and Muon Campus experiments.
Status of Research Premises	All the above mentioned infrastructures belong to FNAL.
Previous and Current Involvement in Research and Training Programmes	FNAL has a long history of hosting or collaborating in world-class particle physics experiments, including CDF, D0, KTeV, NuTeV, and MiniBooNe. FNAL currently hosts MINOS+, NOvA, MINERvA, MicroBooNE, CDF, D0, Muon(g SBND, ICARUS, DUNE, experiment and the LBNF facility. FNAL currently collaborates on the PICO, DarkSide, CDMS, DES, SDSS, and COUPP experiments.
Relevant Publications and/or Research / Innovation Product	**[1]** L. Bartoszek, et al. (Mu2e Experiment), Mu2e Technical Design Report, arXiv:1501.05241 (2015). **[2]** R. Acciarri et al. (MicroBooNE Collaboration), "Design and Construction of the MicroBooNE Detector", JINST 12 (2017), no. 02, P02017. **[3]** M. Antonello et al., (MicroBooNE, LAr1-ND and ICARUS-WA104 Collaborations), "A Proposal for a Three Detector Short-Baseline Neutrino Oscillation Program in the Fermilab Booster Neutrino Beam", 2015, arXiv:1503.01520 [physics.ins-det].

Partner Legal Name: Lawrence Berkeley National Laboratory (LBNL) Physics Division	
General Description	LBNL is a multi-purpose United States National Laboratory conducting scientific research in a wide range of subjects. The LBNL Physics Division participates in experimental and theoretical research relating to Cosmology, Dark Matter searches, and Particle Physics at both the intensity and energy frontiers, with a staff of over 50 staff scientists, over 60 postdocs, over 50 graduate students, and associated engineers and technical staff. For details see https://commons.lbl.gov/display/physics/Physics+Division+Home
Role and Commitment of key persons (including supervisors)	**N. Roe,** director of the Physics Division of LBNL. **D. Brown,** Senior Scientist in the Physics Division of LBNL; Principle Investigator on the Mu2e experiment; Executive board member of Mu2e; Institutions board member of Mu2e; Co-coordinator of software and computing of Mu2e; Calibration coordinator of Mu2e; Former Physics co-coordinator of the Super-B experiment; Former Principle Investigator of the BaBar experiment. **D. Dwyer**, Staff Scientist in the Physics Division of LBNL; Principle Investigator on the DUNE Experiment; Lead developer for cryogenic pixelated LArTPC readout for DUNE; Former analysis committee chair for the Daya Bay Experiment.
Key Research Facilities, Infrastructure and Equipment	The LBNL Physics Division is located at the main LBNL site in Berkeley, California, just above the Berkeley campus of the University of California. This site hosts an operating cyclotron used for particle irradiation studies, a silicon foundry for developing custom ICs, and lab space for developing, assembling and testing electronics and particle detectors.
Status of Research Premises	The LBNL Berkeley site has been an active research premise for nearly 90 years.
Previous Involvement in Research and Training Programmes	LBNL Physics Division has a long history of development and construction of detectors, electronics and software for particle and astro-particle physics, and scientific research at many of the most important experiments in particle physics, including TPC, Mark II, SLD, CDF, D0, HyperCP, BaBar, LUX, Daya Bay, and KamLAND. LBNL Physics Division has hosted numerous interns through the DOE SULI program, the DOE CCI program, the DOE SCGSR program, the UC Berkeley BPURs program, and the UC Berkeley URAP program. LBNL Physics Divisions hosts a yearly week-long Physics and Cosmology program for high school teachers and students.
Current Involvement in Research and Training Programmes	LBNL Physics Division is involved in leading edge HEP experiments in the energy frontier, intensity frontier and cosmic frontier. Notably the Physics Division is currently involved in the ATLAS experiment, the Mu2e experiment, the DUNE/LBNF experiment, the Daya Bay experiment, the LUX-Zeplin experiment, the DESI project, and the BOSS project. LBNL Physics Division is conducting R&D on particle sensors, astrophysical sensors, CMB sensors, custom ICs for sensor readout, readout electronics, and firmware and software development for particle tracking, optical cosmology, dark matter detection, and CMB radiation detection. In FY2019 the Physics Division research budget is over $27M.
Relevant Publications and/or Research / Innovation Product	**[1]** "LArPix: demonstration of low-power 3D pixelated charge readout for liquid argon time projection chambers", D.A. Dwyer et. al., JINST 13, P10007 (2018) **[2]** "Design and Performance of a Custom ASIC Digitizer for Wire Chamber Readout in 65 nm CMOS Technology" M. J. Lee et al.. JINST 10, no. 06, P06007 (2015) **[3]** "Local Alignment of the BABAR Silicon Vertex Tracking Detector" D. N. Brown, A. V. Gritsan, Z. J. Guo and D. Roberts. Nucl. Instrum. Meth. A 603, 467 (2009) .

Partner Organisation Legal Name: Yale University (YALE)	
General description	Yale University is an international research university located in the United States of America. With approximately 5,500 undergraduate students, 6,900 graduate students, and over 4,000 faculty members, Yale has a wide array of programs, departments, schools, centers, museums and many affiliated institutions. Yale University's Physics Department has 32 faculty members and a strong involvement in particle physics research.
Key Persons and Expertise	**B. Fleming** Professor in the Department of Physics, Yale University; Spokesperson of MicroBooNE and member of LArIAT, ArgoNeuT and SBND at FNAL; Deputy Chief Research Officer at FNAL; member of US High Energy Physics Advisory Committee (HEPAP) and P5 (2014); Fellow of the American Physical Society; National Science Foundation CAREER Award Recipient (2006). **S. Demers** Horace D. Taft Associate Professor in the Department of Physics, Yale University; member of the ATLAS and Mu2e Collaborations; Deputy Institutional Board Chair of US ATLAS; ATLAS Upgrade Physics co-convener; Chair of Engaging-Non-Experts Committee for Mu2e; US ATLAS Fellow; US Department of Energy Early Career Award Recipient for 2011-2016. **G. Pezzullo** Postodctoral Research Associate, member of the Mu2e Collaboration, expert in particle detectors simulation, trigger algorithms, data analysis.
Key Research Facilities, Infrastructure and Equipment	The particle physics group at Yale University has state-of-the-art research facilities, mechanical and electronics workshops and clean-rooms, and substantial computing resources. Newly renovated hig-bay space at Yale University's Wright Lab enables R&D and construction activities at Yale and supports active research programs in particle physics, astrophysics and atomic physics. Research facilities are owned by Yale University.
Status of Research Premises	All the above mentioned infrastructures belong to YALE.
Previous and Current Involvement in Research and Training Programmes	The Yale University participants have been involved in many projects research and innovation projects, including CDF, MiniBooNE, FINeSSE, BooNE, CTEQ, and NuTeV. Current Yale University particle physics involvement includes ArgoNeuT, CUORE, Daya Bay, IceCube, LAr1-ND, LArIAT, MicroBooNE, Project8, PROSPECT, DM-Ice, Yale Microwave Cavity Experiment, Mu2e and ATLAS.
Relevant Publications and/or Research / Innovation Product	**[1]** A. A. Aguilar-Arevalo et al. [MiniBooNE Collaboration], "First Measurement of the Muon Neutrino Charged Current Quasielastic Double Differential Cross Section," Phys. Rev. D 81, 092005 (2010) [arXiv:1002.2680 [hep-ex]]. **[2]** ATLAS Collaboration, "Search for additional heavy neutral Higgs and gauge bosons in the ditau final state produced in 36 fb^{-1} of pp collisions at $\sqrt{s}$ = 13 TeV with the ATLAS detector", JHEP 01 (2018) 055. **[3]** A. A. Aguilar-Arevalo et al. [MiniBooNE Collaboration], "The MiniBooNE Detector," Nucl. Instrum. Meth. A 599, 28 (2009).

Partner Organisation Legal Name: Inter-University Research Institute Corporation High Energy Accelerator Research Organisation (KEK)	
General description	KEK, the High Energy Accelerator Research Organization, is one of the world's leading accelerator science research laboratories, using high-energy and/or highly intense particle beams, and synchrotron light sources to probe the fundamental properties of matter. With state-of-the-art infrastructure, KEK is advancing our understanding of the universe that surrounds us, its mechanisms and their control. Established in 1997 in a re-organization of the Institute of Nuclear Study, University of Tokyo (established in 1955), the National Laboratory for High Energy Physics (established in 1971), and the Meson Science Laboratory of the University of Tokyo (established in 1988), KEK serves as a center of excellence for domestic and foreign researchers, providing a wide variety of research opportunities. In addition to the activities at the Tsukuba Campus, KEK is now jointly operating a high-intensity proton accelerator facility (J-PARC) in Tokai village, together with the Japan Atomic Energy Agency (JAEA). Over 600 scientists, engineers, students and staff perform research activities on the Tsukuba and Tokai campuses. KEK attracts nearly 100,000 national and international researchers every year (total man-days), and provides excellent research facilities and opportunities to many students and post-doctoral fellows each year.
Key Persons and Expertise	**S. Mihara**, Full Professor, leader of muon particle physics group at KEK. **H. Nishiguchi**, Associate professor at KEK, leader on tracker detectors, accelerator physics and Monte Carlo simulation. **K. Ueno** and **Y. Fukao**, Assistant professors at KEK. K. Ueno is an expert of detector electronics and Y. Fukao is an expert of beam line.
Key Research Facilities, Infrastructure and Equipment	The KEK Muon Group collaborates on several cLFV experiments and related detector/facility development, including MEG/MEGII, COMET and high-power target R&D. KEK has an extensive detector expertise, with leading roles in the experiments mentioned above. The KEK Muon Group has developed the LXe calorimeter for the MEG experiment, the MEG spectrometer, the muon beam line and straw-tube tracker for the COMET experiment, and several proton beam diagnostic tools along with a proton primary target used in a high-power proton beam accelerator experiment.
Status of Research Premises	All the above mentioned infrastructures belong to KEK.
Previous and Current Involvement in Research and Training Programmes	KEK has a long history of hosting or collaborating in world-class particle physics experin (COMET, T2K, and Belle & Belle II) and outside (MEG/MEG II).
Relevant Publications and/or Research / Innovation Product	**[1]** A.M. Baldini et al. (MEG collaboration) "Search for the lepton flavour violating decay $\mu+ \rightarrow e+ \gamma$ with the full dataset of the MEG experiment" Eur. Phys. J. C (2016) 76:434 **[2]** S. Mihara, J.P. Miller, P. Paradisi, and G. Piredda "Charged lepton flavour-Violation experiments" Ann. Rev. Nucl. And Part. Science (2013) 63:531 **[3]**G. Adamov et al (COMET Collaboration) "COMET Phase-I Technical Design", arXiv:1812.09018

Partner Organisation Legal Name: Massachusetts Institute of Technology (MIT)	
General description	MIT is an international research university located in the United States of America. With approximately 5,000 undergraduate students, 7,000 graduate students, and over 1,100 faculty members, MIT has a wide array of programs, departments, schools, centers, museums and many affiliated institutions. MIT University's Physics Department has about 75 faculty members and a strong involvement in particle physics research.
Key Persons and Expertise	**O. Hen,** Professor in the Department of Physics, PhD in experimental physics at the Tel-Aviv University, MIT Pappalardo Fellow in Physics from 2015-2017, MIT physics faculty since 2017; Awardee of the G. Altarelli award, Bose Fellowship, Fermilab Intensity-Frontier Fellowship, Rothschild Fellowship, A. Pazi Award of the Israeli Council for Higher Education and the Y. Eisemberg Prize of Tel-Aviv University. Expert of studies of QCD effects in the nuclear medium, and the interplay between partonic and nucleonic degrees of freedom in nuclei. Involved in the FNAL Short Baseline Neutrino Program and DUNE.
Key Research Facilities, Infrastructure and Equipment	The particle physics group at MIT University has state-of-the-art research facilities, mechanical and electronics workshops and clean-rooms, and substantial computing resources. MIT laboratories enable R&D and construction activities and support active research programs in particle physics, astrophysics and atomic physics. Research facilities are owned by MIT.
Status of Research Premises	All the above mentioned infrastructures belong to MIT.
Previous and Current Involvement in Research and Training Programmes	The MIT Department of Physics has been involved in many projects research and innovation projects. The particle physics and nuclear physics groups are involved in experiments at Jefferson Laboratory, Brookhaven, Los Alamos, Desy, Cern, Fermilab, and several more in the world. Current MIT University particle physics involvement includes CMS, ATLAS, R&D for futur ILC, BES, Darklight, LHCb, nEDM, OLYMPUS, Qweak, RHIC, MiniBooNE, MicroBooNE IceCUBE, IsoDAR, DAEDALUS, KATRIN, GAPS, NuSTAR, IAXO, CUORE, KamLAND ABRACADABRA, NuDOT, PHOBOS.
Relevant Publications and/or Research / Innovation Product	**[1]** O. Hen et al., "Nucleon-Nucleon Correlations, Short-lived Excitations, and the Quarks Within", Rev. Mod. Phys. 89, 045002 (2017). **[2]** O. Hen et al. (CLAS Collaboration), "Momentum Sharing in Imbalanced Fermi Systems", Science 346, 614 (2014). **[3]** I. Korover, N. Muangma, and O. Hen et al., (JLab Hall-A Collaboration), "Approaching the nucleon-nucleon short-range repulsive core via 4He(e,e'pN) triple coincidence reaction", Phyr. Rev. Lett. 113, 022501 (2014).

Partner Organisation Legal Name: Jefferson Science Associate LLC (JSA)	
General description	JSA manages the Jefferson Laboratory (JLab) for the US Department of Energy Office of Science. JLab is a multi-purpose United States National Laboratory conducting scientific research in a wide range of subjects. Based on his continuous polarized electron beam of unprecedented intensity, it hosts experimental and theoretical research relating to Dark Matter searches, Astrophysics, Nuclear and Hadronic Physics, with a staff of over 700 staff scientists, over 60 postdocs, over 50 graduate students, and associated engineers and technical staff.
Key Persons and Expertise	**P. Rossi,** deputy associate director of the Physics Division of Jlab. **V. Burkert,** Hall-B leader. **B. Wojtsekhowsky**, co-spokeperson of experiments based on SBS spectrometer. **S. Stepanyan**, senior staff scientist, deputy Hall-B group leader, co-spokeperson of the HPS and nucleon 3D experiments. **C. Cuevas**, leader of the fast electronics group. He has led the realization of the pipelined readout electronics and specific developments for several readout systems of detectors at JLab.
Key Research Facilities, Infrastructure and Equipment	JLab hosts a unique particle accelerator, known as the Continuous Electron Beam Accelerator Facility (CEBAF), able to deliver high polarized electron beam to four experimental Halls, for fixed-target experiments with wordwide record luminosities ranging from 10^{35} up to 10^{38} cm^{-2} s^{-1}. The focus is to probe the most basic building blocks of known and alleged matter, whether ordinary, exotic, neutron or dark.
Status of Research Premises	JLab has been an active research premise for nearly 40 years.
Previous and Current Involvement in Research and Training Programmes	JLab has a long history of hosting world-class nuclear physics experiments. JLab currently c to 4 experimental Halls with different apparatus and complementary physics programs tha matter in its fundaments, either it be standard, dark, exotic or ultra-dense.
Relevant Publications and/or Research / Innovation Product	**[1]** V.D. Burkert, L. Elouadrhini, F.X. Girod, "The pressure distribution inside the proton", Nature 557 (2018) 396. **[2]** N. Baltzell et al., "The Heavy Photon Search beamline and its performance", NIMA 859 (2017) 69-75. **[3]** S. Abrahamyan et al., "Measurement of the Neutron Radius of 208Pb Through Parity-Violating Scattering", Phys. Rev. Lett. 108 (2012) 112502. **[4]** X. Qian et al., "Single Spin Asymmetries in Charged Pion Production from Semi-Inclusive Deep-Inelastic Scattering on a Transversely Polarized ^{3}He Target at Q^2=1.4-2.7 GeV^2", Phys. Rev. Lett. 107 (2011) 072003. **[5]** M. Duer et al. (CLAS Collaboration), "Probing high-momentum protons and neutrons in neutron-rich nuclei", Nature 560 (2018) no.7720, 617-621.

Partner Organisation Legal Name: OSAKA University (UOSAKA)	
General description	Osaka University is a public university located in Osaka, Japan. Osaka University is one of Japan's National Seven Universities and is generally considered one of Japan's most prestigious institutions of higher education. It is usually ranked among the top three public universities in Japan, along with the University of Tokyo and Kyoto University. It is ranked third overall among Japanese Universities and 67th worldwide in the 2019 QS World University Rankings. The Japanese Ministry of Education (MEXT) has classified Osaka University as a leading university in the Top Global University Project. It also selected Osaka University as a Designated National University Corporation in 2018. There are approximately 10,000 staff in total and 25,000 students. The School of Science has about 500 stuff and about 2,000 students, among which Department of Physics has about 350 undergraduate and 200 graduate students.
Key Persons and Expertise	**Y. Kuno**, Professor of Physics; Spokesperson of COMET (2010-present), and member of Super-K, and previously K2K, KEK-E246 and BNL-E787/949. Supervisor of Master and PhD students on COMET. Fermilab Physics Advisory Committee member (2008-2011), BELLE Physics Advisory Committee member (2009-2011), Member of European Strategy for Particle Physics preparatory group (2011-2013). International advisory committee members of the conference series of NEUTRINO, WIN, PIC, and NuFACT. **M. Aoki,** Associate professor of Physics; Spokesperson of DeeMe experiment at J-PARC. **A. Sato**, Assistant professor of Physics; Member of COMET and the convener of the COMET Cylindrical drift chamber (CDC) Working Group. Leader of the MuSIC project at Research Centre for Nuclear Physics (RCNP), Osaka University, for muon application science. **H. Yoshida**, Postdoctoral fellow for COMET, member of the COMET CDC working group, the muon-stopping target working group convener, and the COMET slow control working group convener. **C. Wu**, Postdoctoral fellow for COMET, and the COMET CDC tracking group convener. **T. Itahashi**, Visiting professor and professor emeritus of Osaka University; Member of COMET and muon g-2/edm at J-PARC, working on accelerators and muon science. **Y. Koide**, Visiting professor; Lepton phenomenology of elementary particle physics. **D. Tomono,** Postdoctoral fellow; Member of MuSIC, responsible for the MuSIC muon beam line.
Key Research Facilities, Infrastructure and Equipment	Osaka University has 10 schools and 15 graduate schools, including 6 independent research institutes. They are located in two major campuses. The Department of Physics, which is one of departments in School of Science, is located at the Toyonaka campus. There are two High Energy Physics (HEP) groups and two Nuclear Physics Groups at the Department of Physics, which own their laboratories and workshops. At the Suita campus, there is an accelerator facility named RCNP which has a 400 MeV proton cyclotron, where nuclear physics experiments are mostly carried out, along with the MuSIC, which is a new muon source infrastructure, being used for muon application science. MuSIC was constructed based on a novel concept of pion capture system of superconducting solenoids to produce many muons, providing COMET-principle demonstration. RCNP has a high-performance computing centre. The HEP Group has long-standing working relationships with International and domestic particle physics laboratories such as KEK, J-PARC, CERN, Fermilab, RAL, PSI, and TRIUMF.
Previous and Current Involvement in Research and Training Programmes	The HEP Group at Osaka University is involved in leading experiments in the past year DeeMe, muon g-2/edm at J-PARC, Super-Kamiokande, NuFACT, Muon collider, MIC PIENU at TRIUMF, AlCAP at PSI, K2K and KEK-E246 at KEK, BNL-787/949 at BNI muon g-2. Also KOTO, KEK-E391a, ATLAS at CERN. include COMET and DeMee and a 2/edm at J-PARC, and Super-Kamiokande for neutrino physics. Other major activities KOTO experiment, ATLAS at CERN, and Candles for neutrino-less double beta decay 48Ca. Roughly 6 PhD students are currently working within the group, alongside a simila postdocs and fellows.
Relevant Publications and/or Research / Innovation Product	**[1]** "*COMET Phase-I Technical Design Report*, COMET Collaboration", arXiv:1812.0901 (to be published). ***[2]*** *"Atmospheric neutrino oscillation analysis with external constraints in Super-Kamiokande I-IV",* SK collaboration, Phys.Rev. D97, 7 (2018) 072001. **[3]** "*Delivering the world's most intense muon beam*", MuSIC collaboration, Phys.Rev.Accel.Beams 20 (2017) 030101. **[4]** "*First particle-by-particle measurement of emittance in the Muon ionization Cooling Experiment*", MICE collaboration, RAL-P-2018-005, FERMILAB-PUB-18-591-AD-APC-PPD (2018). **[5]** "*A Search for muon to electron conversion at J-PARC; The COMET experiment*", COMET collaboration, PTEP 2013 (2013) 022C01.

Partner Organisation Legal Name: University of Tokyo (UTOKYO)	
General description	The University of Tokyo hosts the world's largest scale research and education center of physics in Japan and covers vast areas of research fields from basic to complex matter on the subatomic to the cosmic level. The University of Tokyo's School of Science conducts research and education across various scientific fields in order to understand the mechanisms of nature and uncover the immutable laws that govern them. The courses cover a wide range of specialized fields in science and are taught by departmental faculty members as well as by faculty from other departments and research institutes of the University of Tokyo or other institutions. Illustrating the breadth of world-class research and superb graduate education being conducted in each department, faculty members and graduates have received numerous international prizes and awards including Nobel Prizes and Fields Medal. The Faculty of Science and the Graduate School of Science (GSS) is an international school strongly opened to student exchanges. The School pursues cutting-edge research in the most advanced fields while fostering students who will lead the next generation of scientists. Through their instruction in the concepts and methodologies of science, students are equipped with the knowledge and means to solve future problems as well as the ability to identify and address new problems. Having developed into deeply creative and internationally-minded scientists, many GSS graduates are currently active at the frontlines of research as postdoctoral fellows at universities, research institutes, and enterprises worldwide.
Key Persons and Expertise	**T. Mori**, Full Professor, Group leader of the MEG/MEGII group at University of Tokyo and co-spokesperson of the MEG and MEGII collaboration, **W. Ootani** Associate professor at University of Tokyo, leader on analysis, MEG and MEGII analysis co-responsible, **T. Iwamoto**, Scientist, leader on detector, responsible of the LXe calorimeter, MEGII technical and run co-coordinator, **Y. Uchiyama**, Scientist, leader on detector, responsible of the MEGII offline data system and the MEGII pixelated Timing Counter detector, **K. Ieki**, Associate Scientist, leader on detector, responsible of the MEGII Radiative Decay Counter detector.
Key Research Facilities, Infrastructure and Equipment	The University of Tokyo collaborates on several cLFV, neutrino and future collider experiments worldwide, including MEG/MEGII, T2K and ILC. University of Tokyo has an extensive analysis and detector expertise, with leading roles in the experiments mentioned above. Th University of Tokyo has developed the LXe calorimeter for the MEG experiment, the MEG analysis framework, the MEG spectrometer, the MEGII pixelated timing counter, the MEGII Radiative Muon Decay. It has a leading role in the analysis including both the $\mu^+ \rightarrow e^+ \gamma$ and exotic searches.
Previous and Current Involvement in Research and Training Programmes	The University of Tokyo has a long history of hosting or collaborating in world-class part experiments on site (T2K, ILC) and outside (MEG/MEG-II).
Relevant Publications and/or Research / Innovation Product	**[1]** W. J. Marciano, T. Mori, and J. M. Roney, "Charged lepton flavor violation experiments", Annual Review of Nuclear and Particle Science (2008) 58:315 **[2]** A.M. Baldini et al. (MEG collaboration) "Search for the lepton flavour violating decay $\mu^+ \rightarrow e^+ \gamma$ with the full dataset of the MEG experiment", Eur. Phys. J. C (2016) 76:434 **[3]** A.M. Baldini et al. (MEGII collaboration) "The design of the MEG II experiment", Eur. Phys. J. C (2018) 78:380.

Partner Organisation Legal Name: University of California, Irvine (UIRVINE)	
General description	The University of California, Irvine (UCI) was founded in 1965 with a mission to catalyze the community and enhance lives through rigorous academics, cutting-edge research, and dedicated public service. Today it draws on the spirit of pioneering faculty, staff, and students who arrived on campus with a dream to inspire change and generate new ideas. Currently the campus counts more than 35000 students, it is the youngest member of the Association of American Universities and is consistently ranked among the best college in the nation. It is committed to providing educational and research opportunities to students, faculty, and staff regardless of gender, race, ethnicity. Particle physics research at UC Irvine spans a broad range of experimental and theoretical topics. The experimental group, founded by Frederick Reines, who won the Nobel Prize for the discovery of the neutrino, currently conducts research at the energy, intensity, and cosmic frontiers. UC Irvine experimentalists play leading roles in collaborations that are searching for new particles and interactions at the Large Hadron Collider, exploring neutrino masses and mixings, looking for new signals of lepton flavor violation, searching for ultra-high energy cosmic neutrinos and dark matter, and probing the nature of cosmic acceleration and dark energy through astronomical surveys of the large-scale structure of the Universe. Particle theorists at UC Irvine exploit innovative ideas in particle physics, astroparticle physics, and cosmology, and at the interfaces of these areas to address outstanding problems in a wide variety of fields. These include searches for new particles and forces at colliders, dark matter particle candidates and their observable signatures, neutrino physics, particle cosmology, and quantum gravity.
Key Persons and Expertise	**William Molzon**, Professor, group leader of the MEG/MEGII and Mu2e group at UC Irvine; **T. Libeiro (**Research Scientist), **D. Palo** and **W. Kyle** (advanced PhD students), leading contributors to hardware and software of calibration methods and to analysis.
Key Research Facilities, Infrastructure and Equipment	The UC Irvine particle physics group collaborates on several cLFV, neutrino, and collider, and astro-particle experiments worldwide, including MEG/MEGII, Mu2e, IceCube, LSST, Ariana, Nova, Super-Kamiokande, DUNE, T2K and ATLAS. The group has extensive analysis and detector expertise and has leading roles in these experiments. The UCI group had significant responsibility of the positron analysis in MEG. It proposed several calibration and analysis framework techniques for several sub-detectors, both in MEG and MEGII, including techniques used for the upgraded MEGII LXe calorimeter and the new MEGII target. It has a leading role in the analysis including both the $\mu^+ \rightarrow e^+ \gamma$ search and exotic searches.
Previous and Current Involvement in Research and Training Programmes	The UC Irvine particle physics group has a long history of hosting or collaborating on world-class particle physics experiments such as the MEG and MEGII experiment, the Mu2e experiment, LHC experiments, and neutrino experiments as well as new theoretical frameworks for addressing unanswered questions in the context of the standard model. They have hosted number national and international conferences and have trained hundreds of graduate students and post-doctoral researches, many of whom have gone on to jobs and Universities and National Laboratories.
Relevant Publications and/or Research / Innovation Product	**[1]** A.M. Baldini et al. (MEG collaboration) "Search for the lepton flavour violating decay $\mu^+ \rightarrow e^+ \gamma$ with the full dataset of the MEG experiment", Eur. Phys. J. C (2016) 76:434. **[2]** A.M. Baldini et al. (MEGII collaboration) "The design of the MEG II experiment", Eur. Phys. J. C (2018) 78:380. [3] L. Bartoszek et al. (Mu2e collaboration) "Mu2e technical design report", arXiv:1501.05241.

7. Ethics Issues

Research activities related to the PROBES project do not involve ethics issues, except the involvement of non-EU countries and the exportation of materials from EU to non- EU countries. This exportation involves just the detector components and the electronic and mechanical equipment needed for the construction and commissioning of the detectors. No personal data or any other ethically sensitive item will be exported. Ethical standard and guidelines of Horizon2020 will be rigorously applied, regardless of the country in which the research is carried out. The research performed outside EU is compatible with the Union, National and International legislation and could have been legally conducted in one of the EU Member States.

8. Letters of Commitment of Third Country Partner organisations

The letters of commitment are from the following Partners:

Fermi Research Alliance, signed by Nigel S. Lockyer Director of Fermilab;

KEK - Inter-University Research Institute Corporation, High Energy Accelerator Research Organization, signed by Prof. Satoshi Mihara;

Yale Department of Physics, signed by Prof. Paul L. Tipton, Chair, Department of Physics;

LBNL – Ernest Orlando Lawrence Berkeley National Laboratory, signed by Natalie Roe, LBNL Physics Division Director;

Osaka University, School of Science, Graduate school of Science, signed by Prof. Masayuki Asakawa, Chair of Department of Physics;

Massachusetts Institute of Technology, Laboratory for Nuclear Science, signed by Prof. Boleslaw Wyslouch, Director of the Laboratory for Nuclear Science;

University of California, Irvine, Department of Physics and Astronomy, signed by Prof. William Molzon, coordinator of the Particle Physics Group;

University of Tokyo, The International Center for Elementary Particle Physics, signed by Prof. Toshinori Mori;

Jefferson Science Associates, Thomas Jefferson National Accelerator Facility, signed by Stuart Henderson, Director of Jefferson Laboratory.

Fermi National Accelerator Laboratory

Nigel S. Lockyer
Director

Directorate
P.O. Box 500, MS 105
Kirk Road and Pine Street
Batavia, Illinois 60510-5011
USA
Office: 630.840.3211
lockyer@fnal.gov

February 22, 2019

To Whom It May Concern:

Fermi National Accelerator Laboratory (Fermilab) will be pleased to participate in the Marie Skłodowska-Curie Research and Innovation Staff Exchange (H2020-MSCA-RISE-2019) call proposal "PROBES". Fermilab is constructing a Muon Campus to host two world-class experiments exploiting muons and neutrinos to perform discovery science. We have a long history of collaboration with international partners and would warmly welcome our scientific colleagues included in this proposal.

Specifically, Fermilab will

1. Act as a host institution for secondments from the PROBES participants
2. Provide a work environment for the seconding personnel that encourages collaboration and ensures the efficient fulfillment of the project objectives
3. Contribute to the knowledge exchange between Fermilab and the PROBES participants.

These commitments are conditioned on laboratory priorities, receiving all DOE approvals including Contracting Officer approvals, and availability of funding for such endeavors at Fermilab. Please note that all seconding personnel will require an appropriate visa to work in the United States and the home institutions for seconding personnel may be asked to sign a Non-Proprietary User Facility Agreement.

Sincerely,

Nigel S. Lockyer
Director of Fermilab

cc: E. Barzi
S. Donati

1-1.OHO.TSUKUBA-SHI
IBARAKI-KEN.305-0801 JAPAN
http://www.kek.jp/
E-Mail: satoshi.mihara@kek.jp

Date: 12 February 2019

To whom it may concern,

The muon particle physics group at Institute of Particle and Nuclear Studies (IPNS), High Energy Accelerator Research Organization (KEK) in Japan is pleased to participate in the Marie Sklodowska-Curie Research and Innovation Staff Exchange (H2020-MSCA-RISE-2019) call proposal "PROBES". The muon particle physics group at IPNS-KEK will be able to host scientific colleagues participating in this program using KEK/J-PARC facilities.

Muon particle physics group conducts research work to search for hints of new physics beyond the standard model of elementary particle physics using highly intense muon beam, and hosts two international collaborations of particle physics experiments ongoing at J-PARC. Development of new detector technologies is also ongoing in collaboration with J-PARC/KEK research supporting staff members. It is possible to provide opportunities to learn various kinds of technology and/or experiment techniques to participants.

Visitors to KEK/J-PARC through the PROBES program are welcomed as KEK/J-PARC users and can receive support regarding research infrastructure such as computing, network, meeting rooms, and other kind of campus services.

Sincerely yours,

Professor Satoshi MIHARA
Group leader of muon particle physics
Institute of Particle and Nuclear Studies (IPNS)
High Energy Accelerator
Research Organization (KEK)

Yale University

Department of Physics
P.O. Box 208121
New Haven, Connecticut 06520-8121

Campus address:
554 J.W. Gibbs Laboratory
Telephone: 203 432-3388
Fax: 203 432-6125

February 10, 2019

To Whom It May Concern:

The Yale Physics Department is very pleased to participate in the Marie Skłodowska-Curie Research and Innovation Staff Exchange (H2020-MSCA-RISE-2019) known as the PROBES program. Yale is quite enthusiastic about hosting PROBES participants here at Yale, most likely at our newly-renovated Wright Lab facility.

As you might know we have very active Microboone and Mu2e collaboration members here at Yale. We see the PROBES program as an ideal way to strengthen ties between Fermilab and the leading European High Energy Physics programs. Yale is eager to help in that effort, but we also hope to strengthen ties between Yale and our European colleagues for the benefit of all.

The rebuilt Wright Lab is a visitor-friendly hub for high-energy and nuclear physics. The lab houses excellent technical facilities and expert staff to help carry out projects from the R&D phase through construction and data analysis. We also have a strong theoretical physics group that helps enliven the intellectual environment.

In conclusion, the Yale Physics Department is enthusiastic in our commitment to the PROBES program. We very much hope to host one or more visitors here on campus.

Sincerely,

Paul L. Tipton
Prof. of Physics
Chair, Dept of Physics
Yale University

February 14, 2019

To Whom it May Concern:

The Lawrence Berkeley National Laboratory (LBNL) Physics Division will be pleased to participate in the Marie Skłodowska- Curie Research and Innovation Staff Exchange (H2020-MSCA-RISE-2019) proposal known as "PROBES". The LBNL Physics Division leads and participates in a number of international experiments in particle physics and cosmology. We have a long history of collaboration with international partners and would warmly welcome our scientific colleagues included in this proposal.

Specifically, LBNL will:

1. Act as a host institution for secondments from the PROBES participants

2. Provide a work environment for the seconding personnel that encourages collaboration and ensures the efficient fulfillment of the project objectives

3. Contribute to the knowledge exchange between LBNL and the PROBES participants.

These commitments are conditioned on laboratory priorities, receiving all DOE approvals including Contracting Officer approvals, and availability of funding for such endeavors at LBNL. Please note that all seconding personnel will require an appropriate visa to work in the United States and the home institutions for seconding personnel may be asked to sign a Non- Proprietary User Facility Agreement.

Sincerely,

Nataliia Kove

LBNL Physics Division Director
1 Cyclotron Road
Berkeley CA 94720

OSAKA UNIVERSITY
School of Science. Graduate School of Science

1-1 Machikaneyama, Toyonaka 560-0043, Osaka, Japan
Phone: +81-6-6850-6111 Fax: +81-6-6850-5288

OSAKA UNIVERSITY

2019/03/11

Dr. Masayuki Asakawa
Professor of Physics
Email: yuki@phys.sci.osaka-u.ac.jp

To Whom It May Concern:

The Physics Department of Osaka University is very pleased to participate in the Marie Skłodowska-Curie Research and Innovation Staff Exchange (H2020-MSCA-RISE-2019) known as the RISE program. Osaka University is highly enthusiastic about hosting RISE participants here at Osaka.

As you might know we have very active COMET collaboration members here at Osaka. We see the RISE program as an ideal way to strengthen ties between Japan and the leading European High Energy Physics programs. Osaka University is eager to help in that effort, but we also hope to strengthen ties between Osaka University and our European colleagues for the benefit of all.

The Physics Building at Osaka University is a visitor-friendly hub for high-energy and nuclear physics. The lab houses excellent technical facilities and expert staff to help carry out projects from the R&D phase through construction and data analysis. We also have a strong theoretical physics group that helps enliven the intellectual environment.

In conclusion, the Osaka University Physics Department is enthusiastic in our commitment to the RISE program. We very much hope to host one or more visitors here on campus.

Sincerely,

Masayuki Asakawa

Dr. Masayuki Asakawa
Professor of Physics
Chair of Department of Physics,
Osaka University

Boleslaw Wyslouch
Director
Professor of Physics

Laboratory for Nuclear Science
http://web.mit.edu/lns

Massachusetts Institute of Technology
77 Massachusetts Avenue, Building 26-505
Cambridge, Massachusetts 02139–4307

Phone 617–253-7800
Fax 617–253-0111
wyslouch@mit.edu

March 12, 2019

To Whom It May Concern:

The Laboratory for Nuclear Science (LNS) at the Massachusetts Institute of Technology (MIT) will be pleased to participate in the Maria Skłodowska-Curie Research and Innovation Staff Exchange (H2020-MSCA-ISE-2019) call proposal "PROBES". Researchers at LNS are involved in several activities in the area of Neutrino Physics research at the Fermi National Accelerator Laboratory. We have a long history of collaboration with international partners and would warmly welcome our scientific colleagues included in this proposal.

Specifically, LNS will

1. Act as a host institution for secondments from the PROBES participants
2. Provide a work environment for the seconding personnel that encourages collaboration and ensures the efficient fulfillment of the project objectives
3. Contribute to the knowledge exchange between LNS and the PROBES participants.

These commitments are conditioned on laboratory priorities and availability of funding for such endeavors at LNS. Please note that all seconding personnel will require an appropriate visa to work in the United States, and the seconding personnel and home institutions for seconding personnel will be asked to sign an Inventions and Proprietary Information Agreement.

Sincerely,

Boleslaw Wyslouch
Director of LNS and
Bates Research and Engineering Center

BW:el
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UNIVERSITY OF CALIFORNIA, IRVINE

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF PHYSICS AND ASTRONOMY

IRVINE, CALIFORNIA 92697-4575

PROFESSOR WILLIAM R. MOLZON
TELEPHONE: (949)824-5987
FAX: (949)824-7478
E-MAIL: wmolzon@uci.edu

25 March 2019

To whom it may concern:

The particle physics group led by Professor William Molzon at the University of California, Irvine (UCI) in the United Sates is pleased to participate in the Marie Sklodowska-Curie Research and Innovation Staff Exchange (H2020-MSCA-RISE-2019), call proposal "PROBES". The group will be pleased to host scientific colleagues participating in this program using UCI facilities.

Our group has conducted and is continuing to conduct research to search for hints of new physics beyond the Standard Model of elementary particle physics. We are currently involved in two such experiments. One uses the most intense, low energy, continuous muon beam in the world at the Paul Scherrer Institute in Villigen, Switzerland, participating in the MEG and MEGII experiments. The second uses what will be the most intense pulsed muon beam in the world, currently in construction at Fermilab near Chicago in the United States, participating in the Mu2e experiment. Our group has a long history of proposing and executing new generations of charged lepton flavor violation experiments, developing new detector technologies and calibration techniques, and devising and implementing analysis strategies and frameworks. In particular, for MEG and MEG2 we have had a leading role in calibration methods and data analysis. Through the proposed program, we hope to provide opportunities for participants to learn various kinds of experimental techniques and data analysis methods, and to learn from them.

Visitors to UCI through the PROBES program will be welcomed to UCI; we will provide support in the way of research infrastructure such as computing, network connections, meeting rooms and office space, and other campus services. Participants may also benefit from interactions with our experimental and theoretical particle physics colleagues who are conducting a broad and vigorous research program in the field.

Sincerely,

William Molzon
Professor, Physics and Astronomy

東京大学
素粒子物理国際研究センター
International Center for Elementary Particle Physics
The University of Tokyo

FACULTY OF SCIENCE BLDG. 1
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PHONE: +81-3-3815-8384
FAX : +81-3-3814-8806
E-MAIL : mori@icepp.s.u-tokyo.ac.jp
http://www.icepp.s.u-tokyo.ac.jp/

25th March, 2019

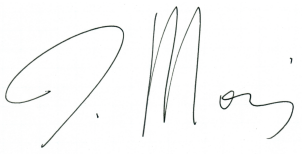
To whom it may concern,

Our research group at International Center for Elementary Particle Physics (ICEPP), the University of Tokyo, is pleased to participate in the Marie Sklodowska-Curie Research and Innovation Staff Exchange (H2020-MSCA-RISE-2019) call proposal "PROBES." We are pleased to host scientific colleagues who participate in this program using our University's facilities.

Our group conducts research work to search for hints of new physics beyond the standard model of elementary particle physics using the world's most intense low energy continuous muon beam at the Paul Scherrer Institute in Villigen, Switzerland. The group has a deep and long experience in developments of new detector technologies as a breakthrough for future particle physics researches, including the 2.7-ton liquid xenon photon detector and the COBRA positron spectrometer with specially gradient magnetic field. It has had a leading role on the data analysis that produced various important physics results in international collaborations. We are happy to provide international participants with opportunities to learn and collaborate on various kinds of detector technologies, experimental techniques and data analysis methods.

Visitors to the University of Tokyo through the PROBES program are welcomed as our official users and shall receive various supports regarding research infrastructure such as computing, network, meeting rooms, and other kind of campus services.

Sincerely yours,



Toshinori MORI
Professor
International Center for Elementary Particle Physics
The University of Tokyo

Jefferson Science Associates

Thomas Jefferson National Accelerator Facility

March 26, 2019

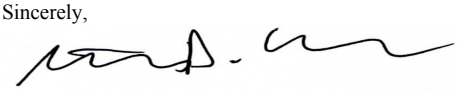
To Whom It May Concern,

Jefferson Science Associates (JSA), as the management and operations contractor of the Thomas Jefferson National Accelerator Facility (TJNAF) is pleased to extend this letter of support to the members of our user community submitting the proposal "PROBES" in their pursuit of the Marie Sktodowska-Curie Research and Innovation Staff Exchange (H2020-MSCA-RISE-2019) program.

We are eager to continue the collaboration in the full suite of Jefferson Lab's scientific program in fundamental hadron physics, QCD and particle physics. In particular, the programs centered on the use of the world-leading polarized electron beam for experiments of light dark-matter search, ultra-dense matter equation of state and nucleon 3D imaging (partonic tomography in space and momentum) offer exciting opportunities for discovery.

Should this effort be successful we remind members of the user community that a properly executed user agreement is required before accessing the TJNAF facility. More information on this process is found at https://science.energy.gov/user-facilities/user-resources/user-agreements/ or through the Jefferson Lab User Liaison Office.

Sincerely,



Stuart Henderson
Director, Jefferson Lab

12000 Jefferson Avenue, Newport News, VA 23606 • phone 757.269.7100 • fax 757.269.7363 • www.jsallc.org

ENDPAGE

MARIE SKŁODOWSKA-CURIE ACTIONS

Research and Innovation Staff Exchange (RISE)

Call: H2020-MSCA-RISE-2019

PART B

"PROPOSAL ACRONYM"