



COLLABORATION AGREEMENT
between
INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY
and
CENTRO BRASILEIRO DE PESQUISAS FÍSICAS

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This Agreement is entered into in Braga (Portugal), on 17 March 2026 (the ‘Execution Date’), by and between the undersigned

PARTIES:

- (1) INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY (‘the INL’)**, an intergovernmental organization validly existing under its own Statute, with its registered office at Avenida Mestre José Veiga, 4715-330 Braga (Portugal), hereby duly represented by **Prof. Clivia M. Sotomayor Torres**, as Director General of the INL.
- (2) CENTRO BRASILEIRO DE PESQUISAS FÍSICAS (‘the CBPF’)**, with address in Rua Dr. Xavier Sigaud 150, 22290-180-Urca-Rio de Janeiro represented for the purpose of signing this Collaboration Agreement by **Márcio Portes de Albuquerque**, as Director of the CBPF.

separately, the inl and the cbpf shall also be referred to herein as the “party” and jointly as the “Parties”.

WHEREAS:

- (1) The INL is an intergovernmental organisation created to promote interdisciplinary research on nanotechnology and nanoscience. The Research and Technology activities focuses on three grand areas: Information and Communication Technologies (ICT), Personalised Health & Food, and Energy & Environment. The full-fledged nanotechnology laboratory enables leading research of the highest international standard.
- (2) The Centro Brasileiro de Pesquisas Físicas (CBPF) is a leading federal research institute in Brazil dedicated to fundamental and applied research in physics. Founded in 1949 and currently linked to the Brazilian Ministry of Science, Technology and Innovation (MCTI), CBPF plays a central role in advancing scientific knowledge, training highly qualified human resources, and fostering national and international collaborations.
- (3) INL and CBPF wish to jointly pursue collaborative activities of mutual interest in respect of the areas of materials science and nanotechnology, by establishing a formal and sustainable link between the INL and the CBPF.
- (4) This Collaboration Agreement has been concluded in consideration of the personal and institutional characteristics of the Parties, so it shall be regarded as special for all intents and purposes,
- (5) The Parties have a mutual interest in developing the cooperation activities described in Annex 1 to this Agreement.
- (6) The Parties further acknowledge that in the course of said activities the Parties may be exposed to proprietary and/or commercially valuable information or materials of the INL and/or the CBPF. All Parties recognise the importance of holding in confidence such information or materials.
- (7) The research carried out under said cooperation activities may lead to results that must be protected through intellectual and industrial property rights.

NOW THEREFORE the Parties, mutually recognising their legal capacities to contract and oblige themselves, conclude this Agreement through their legal representatives, subject to the following:

CLAUSES

1. Definitions

Activities: The cooperation activities as described in Annex 1.

Agreement: This Collaboration Agreement between the Parties for the development of the Activities.

Effective Date: Notwithstanding the Execution Date, the Parties agree that this Agreement is deemed to have become effective on 1 July 2025.

Equipment: All materials, both technical and non-technical, including any machinery, material samples, construct, strain, replication, progeny or derivative that contains any of the materials, and all Know-how supplied by each Party relating to any of the Materials.

Field of Application: The Field defined by the Parties, which defines the research and commercial use of the Foreground Knowledge generated under this Agreement is the following: Condensed Matter Physics.

Force Majeure: A failure to perform any obligation under this Agreement in so far as the Party concerned proves: (i) that the failure was due to an impediment beyond its control, and (ii) that it could not reasonably be expected to have taken into account the impediment and its effects upon his ability to perform at the time of the conclusion of this Agreement, and (iii) that it could not reasonably have avoided or overcome it or its effects.

Industrial and Intellectual Property Rights (IP): all patents, trademarks, service marks, drawings, utility models, design rights, business ideas, concepts, inventions, discoveries, breeders' rights, copyright (including the copyright in software in any code), database rights, computer programs, know-how, trade secrets and other confidential information, technology, business or trade names, goodwill and all other rights of a similar or corresponding nature in any part of the world, whether registered or not or capable of registration or not, and including all applications and the right to apply for any of the foregoing rights.

Know-how: any unpatented technical information (including, without limitation, information relating to inventions, discoveries, concepts, methodologies, models, research, development and testing procedures, the results of experiments, tests and trials, manufacturing processes, techniques and specifications, quality control data, analyses, reports and submissions) that is not in the public domain.

INL's Background IP: any Intellectual Property or Materials (regardless of the form or medium in which they are disclosed or stored): (i) licensed to or owned by the INL prior to the date of the Agreement; or (ii) licensed to or created by the INL independently of performance of the INL's obligations under this Agreement.

CBPF's Background IP: any Intellectual Property or Material (regardless of the form or medium in which they are disclosed or stored): (i) licensed to or owned by the CBPF prior to the date of this Agreement; or (ii) licensed to or created by the CBPF independently of the performance of the CBPF's obligations under this Agreement.

Foreground IP: any IP created by a Party, alone or jointly, whilst performing its obligations under the Agreement during the course of the Activities and in connection thereto.

2. Subject matter

- 2.1. The subject matter of this Agreement is to set out the legal relationship between the Parties in relation to the development of the cooperation activities by the persons designated by the CBPF for this purpose.
- 2.2. The CBPF hereby designates the following persons (hereinafter, 'the Researcher') to participate in the Activities at INL:
 - (a) Ms. Tatiana Gabriela Rappoport.
- 2.3. The Researcher shall participate in the following projects:
 - a) "Orbital Engineering for Innovative Electronics (OBELIX)" - Horizon Europe - Pathfinder 101129641.
 - b) "OrBital based electronicS (ORBIS)" – Horizon Europe – MSCA Doctoral Network 101226840.
- 2.4. The subject matter of this Agreement and the exact scope of the Activities to be performed are described in the Plan attached as Annex 1 hereto.
- 2.5. This Plan may be updated and/or supplemented on the basis of new and ongoing projects or developments, which must be coordinated and signed by the Parties. The latest version, which must be signed by all the Parties, shall apply. However, for amendments that involve more than a mere adjustment of the Plan, Clause 4.7. shall apply.

3. Term

- 3.1. This Agreement shall enter into force on the Effective Date. Unless terminated earlier in accordance with clause 10 ('Termination') or this clause, this Agreement shall continue for a period of four (4) year ['Initial Term']. The Parties may agree in writing to extend this Agreement before the end of the Initial Term for a period of one (1) year ['Extended Term'] at the end of the Initial Term and at the end of each Extended Term. Additionally, the Parties may agree in writing to terminate this Agreement before the end of the Initial Term or the relevant Extended Term, as the case may be.
- 3.2. Survival of rights and obligations. The provisions laid down in Clauses 8, 10, 12, 13 and 15 shall survive the expiration or termination of this Agreement.

4. Performance of the Activities and management

- 4.1. The Parties shall perform the Activities to the best of their ability using their own existing know-how and experience gained during the cooperation in close contact with each other.
- 4.2. The Parties shall provide each other with all of the information needed for the performance of the Activities following prior coordination. Unless otherwise stipulated in this Agreement, any documents, objects or other resources which one of the Parties needs in order to perform the work shall be provided by the other Party as a loan. They shall be used exclusively for the purposes of performing the work and shall be returned to the respective Party at the latter's request after the work has been completed.

- 4.3. The Parties shall permit each other to see any results under this Agreement that have been achieved at all times upon request.
- 4.4. Neither of the Parties shall be entitled to commission third parties with the implementation of partial tasks under this Agreement without the other Party's consent.
- 4.5. Neither of the Parties shall have the right to represent the other Party with respect to any legal relations or to issue any legally binding declarations on the other Party's behalf. No steering groups, working groups or similar groups that might potentially be set up by the Parties shall have the right to represent the other Party or both Parties with respect to any legal relations or to issue legally binding declarations on the other Party's behalf unless it is expressly regulated in this Agreement.
- 4.6. Amendments
 - 4.6.1. Either Party may, at any time during the term of this Agreement, contact the other Party with a view to renegotiating the terms or conditions of the Agreement if, in its opinion, a reasonable adjustment to such terms and conditions is required.
 - 4.6.2. No modification, amendment or waiver of this Agreement or of any clause hereof shall be binding on either Party unless made or confirmed previously in writing through their duly authorised representatives.
- 5. Status at the INL**
 - 5.1. The Researcher collaborating at INL's facilities, will be granted the status of associated member of the personnel in the category of Scientific Associate, in accordance with the INL's Staff Rules and Regulations. As such, they will not be employed by the INL.
 - 5.2. During the execution of this Agreement, the Researcher shall at all times remain employed by CBPF and CBPF shall ensure that, through itself or directly by the Researcher, as the case may be, there shall at all times during the latter's association with the INL be adequate insurance cover against professional accidents valid in Portugal and against health care costs. Social Security contributions, salaries and benefits, where applicable, will be the responsibility of the CBPF.
- 6. Financial provisions**
 - 6.1. Except when otherwise specifically agreed in writing, all costs resulting from the execution of the Activities shall be borne by the Party that incurs them.
- 7. Responsibilities of the Parties**
 - 7.1. Each Party undertakes to take part in the efficient implementation of the Activities and to allocate the appropriate resources, as well as cooperate, perform and fulfil, promptly and on time, all of its obligations under this Agreement as may be reasonable required from it and in a manner of good faith.
 - 7.2. Each Party undertakes to keep information up to date and to notify promptly any significant information, fact, problem or delay likely to affect this Agreement.

7.3. Each Party shall promptly provide all information reasonably required by the other Party to carry out its tasks. Each Party shall take reasonable measures to ensure the accuracy of any information or materials it supplies to the other Party.

8. Industrial and Intellectual Property Rights

8.1. During the term of this Agreement, the Parties shall have a mutual, royalty-free, non-exclusive licence to use one another's Background Knowledge to the extent it is necessary for the completion of this Agreement, insofar as the Parties are able to grant such licence and subject to third party rights.

8.2. This non-exclusive licence shall neither constitute a right to commercial exploitation of such Background Knowledge nor a right to issue sub-licences to third parties. This non-exclusive licence shall expire without further notice once the Activities has been completed and, in any case, not later than at the end of the Term of this Agreement.

8.3. All Foreground IP shall be beneficially owned jointly by the Parties pro rata to their contribution to such Foreground IP according to the following criteria: (i) use of each Parties' funds, equipment, facilities and/or other resources; (ii) use of Background IP belonging to each Party; and/or (iii) participation of each Party's members of the personnel. All forms of disposal of jointly owned Foreground Knowledge shall require a separate joint ownership and management agreement between the Parties. Notwithstanding the foregoing, under the projects specifically described in Annex I, namely OBELIX and ORBIS (the 'Projects') all Industrial and Intellectual Property Rights developed by the Researcher shall vest on INL.

8.4. Each of the Parties shall notify the other promptly after identifying any result that it believes is patentable or otherwise protectable and will supply copies of those results.

8.5. Both Parties agree to cooperate with each other in the identification of the Foreground IP referred in Clause 8.3. and in providing information for the preparation of patent or copyright applications or other intellectual property protections on such Inventions.

8.6. Foreground IP that does not give rise to industrial property rights may be disclosed publicly, in writing or oral presentation.

8.7. Prior notice of any planned publication regarding Foreground IP shall be given to the other Party at least 45 calendar days before the publication.

8.8. Publication of Foreground IP shall always take place with due respect for the duty of confidentiality laid down in Clause 13 of the Agreement.

8.9. Each Party agrees that any publication in a scientific/academic journal shall give due acknowledgement to the contribution of the other in accordance with standard scientific practice. The joint authorship and the institutional affiliations of the authors shall be cited.

9. Materials

9.1. During the term of this Agreement, it may be necessary for the Parties to provide each other with various proprietary Materials for which the following terms will apply.

- 9.2. Materials will be provided solely for use in the Activities, in the Receiving Party's laboratories only. The Parties undertake that any Materials provided will be used only by the persons required to perform the Activities. The Materials will not be provided to any other scientist or institution, public or private, without prior written permission from the supplying Party. The loan of Material shall be governed by a separate written agreement between the Parties.
- 9.3. On termination of this Agreement the Parties will discontinue use of the Materials and at the direction of the supplying Party any remaining Materials will be returned to the supplying Party or destroyed, and destruction certified by the Party.
- 9.4. All experimental work within the Activities and any destruction of Materials will be carried out in accordance with all applicable local, national and international legislation relating to the safe handling, use and disposal of potentially hazardous materials.

10. Liability

- 10.1. No warranties
- 10.1.1. In respect of any advice, information or Materials supplied by one Party to another under this Agreement, no warranty or representation of any kind is made, given or implied, as to the sufficiency or fitness for purpose nor as to the absence of any infringement of any proprietary rights of third parties. Therefore, the recipient Party shall in all cases be entirely and solely liable for the use to which it puts such information and materials, and no Party granting Access Rights shall be liable in case of infringement of proprietary rights of a third party resulting from any other Party exercising its Access Rights.
- 10.1.2. The Parties provide no representation or warranty and cannot be held liable if their performance in connection with the completion of the Activities does not lead to a specific result. In addition, the Parties accept no responsibility for any use which may be made of any work carried out under or pursuant to this Agreement, or of the results of the Activities, nor on any reliance which may be placed on such works or results, nor for advice or information given in connection with them.
- 10.2. Limitations of contractual liability
- 10.2.1. No Party shall be responsible to any other Party for any indirect or consequential loss or similar damage such as, but not limited to, loss of business or profit, loss of revenue or loss of contracts.
- 10.2.2. The terms of this Agreement shall not be construed to amend or limit any Party's statutory liability.
- 10.3. Damage caused to third parties
- Each Party shall be solely liable for any loss, damage or injury to third parties resulting from the performance of the said Party's obligations by it or on its behalf under this Agreement.
- 10.4. Force Majeure
- 10.4.1. No Party shall be considered to be in breach of this Agreement if it is prevented from fulfilling its obligations under the Agreement by Force Majeure.

- 10.4.2. Each Party will notify the other Party of any Force Majeure without undue delay. If the consequences of Force Majeure for the Activities are not overcome within 6 weeks after such notification, the transfer of tasks – if any – shall be decided by the Parties’ representatives pursuant to Clause 4.
- 10.5. The CBPF and Researcher hereby represent that this collaboration is compliant with the responsibilities in the cooperation for the Projects, and further represent that they shall hold harmless and indemnify INL from any and all liabilities arising therefrom.

11. Termination

- 11.1. The Parties may terminate this Agreement by:
- (a) Mutual agreement by the Parties;
 - (b) The dissolution of either Party or if either Party ceases or otherwise terminates its official activities; or
 - (c) The breach of contractual obligations by one of the Parties, unless the Party in breach remedies the breach within not more than thirty (30) days once duly notified of the breach by the other Party.
- 11.2. Once this Agreement has been terminated on any ground, all of the rights and obligations arising prior to its termination shall be liquidated and fulfilled by both Parties, without prejudice to any rights and obligations flowing from such termination for the Parties, pursuant to the provisions of this Agreement.

12. Data protection

- 12.1. Data Protection Legislation means all applicable data protection and privacy legislation and all other legislation and regulatory instruments and requirements in force from time to time which apply to each Party relating to the use of Personal Data, including, without limitation, the privacy of electronic communications and codes of practice applicable. The Parties undertake to comply with the provisions and the requirements of the Data Protection Legislation.
- 12.2. Without prejudice to the generality of the previous number, each Party shall, in relation to any personal data processed in connection with the performance of its obligations under this Agreement: i) ensure that it has all necessary appropriate consents and notices in place to enable lawful processing of personal data, ii) process personal data only for the purposes and to the extent required by the Agreement; iii) keep personal data only as long as is necessary for the purposes of the Agreement; iv) ensure that it has in place appropriate technical and organisational measures to protect against unauthorised or unlawful processing, accidental loss, destruction or damage to personal data, having regard to the state of technological development and the cost of implementing any measures; v) ensure that all personnel who have access to and/or process personal data are obliged to keep the personal data confidential; vi) ensure that personal data is not transferred without suitable safeguards and only when the Data Protection Legislation requirements are met; vii) notify the other Party immediately on becoming aware of a personal data breach, and viii) maintain records and/or information to demonstrate its compliance with this clause.

12.3. This clause is in addition to, and does not relieve, remove, or replace a Party's obligations or rights under the Data Protection Legislation applicable to each Party.

13. Duty of confidentiality

13.1. All information in whatever form or mode of communication, which is disclosed by a Party (the 'Disclosing Party') to any other Party (the 'Recipient') in connection with this Agreement during its execution is 'Confidential Information'. Confidential information shall also be considered all information in whatever form or mode of communication, which has been explicitly marked as 'confidential' at the time of disclosure, or which is disclosed in circumstances in which a reasonable person receiving such information would be expected to understand it was imparted under an obligation of confidence.

13.2. The Recipients hereby undertake:

- (a) Not to use Confidential Information otherwise than for the purpose for which it was disclosed;
- (b) Not to disclose Confidential Information to any third party without the prior written consent by the Disclosing Party;
- (c) To ensure that internal distribution of Confidential Information by a Recipient shall take place on a strict need-to-know basis; and
- (d) To return to the Disclosing Party on demand all Confidential Information which has been supplied to or acquired by the Recipients including all copies thereof and to delete all information stored in a machine readable form. The Recipients may keep a copy to the extent it is required to keep, archive or store such Confidential Information because of compliance with applicable laws and regulations or for the proof of on-going obligations.

13.3. The Recipients shall be responsible for the fulfilment of the above obligations on the part of their employees or third parties involved in this Agreement and shall ensure that they remain so obliged, as far as legally possible, during and after the end of this Agreement and/or after the termination of the contractual relationship with the employee or third party.

13.4. The above shall not apply for disclosure or use of Confidential Information, if and in so far as the Recipient can show that:

- (a) The Confidential Information becomes publicly available by means other than a breach of the Recipient's confidentiality obligations;
- (b) The Disclosing Party subsequently informs the Recipient that the Confidential Information is no longer confidential;
- (c) The Confidential Information is communicated to the Recipient without any obligation of confidence by a third party who is to the best knowledge of the Recipient in lawful possession thereof and under no obligation of confidence to the Disclosing Party;
- (d) The Confidential Information, at any time, was developed by the Recipient completely independently of any such disclosure by the Disclosing Party; or
- (e) The Confidential Information was already known to the Recipient prior to disclosure; or

- (f) The Recipient is required to disclose the Confidential Information in order to comply with applicable laws or regulations or with a court or administrative order, subject to the provision of Clause 13.7 hereunder.
- 13.5. The Recipient shall apply the same degree of care with regard to the Confidential Information disclosed within the scope of this Agreement as with its own confidential and/or proprietary information, but in no case less than reasonable care.
- 13.6. Each Party shall promptly advise the other Party in writing of any unauthorised disclosure, misappropriation or misuse of Confidential Information after it becomes aware of such unauthorised disclosure, misappropriation or misuse.
- 13.7. If any Party becomes aware that it will be required, or is likely to be required, to disclose Confidential Information in order to comply with applicable laws or regulations or with a court or administrative order, it shall, to the extent it is lawfully able to do so, prior to any such disclosure notify the Disclosing Party and comply with the Disclosing Party's reasonable instructions to protect the confidentiality of the information.
- 13.8. The confidentiality obligation shall survive the termination of this Agreement.

14. Miscellaneous

14.1. Entire agreement

This Agreement supersedes all other agreements or contracts concluded between the Parties prior to the execution of the Agreement in relation to the Activities.

14.2. This Agreement consists of this core text and the following Annexes:

- Annex 1: Plan of Activities.

14.3. Inconsistencies and severability

Should any provision of this Agreement become invalid, illegal, or unenforceable, it shall not affect the validity of the remaining provisions of this Agreement. In such a case the Parties shall be entitled to request that a valid and practicable provision be negotiated which best fulfils the purpose of the original provision.

14.4. No representation, partnership or agency

14.4.1. No Party shall be entitled to act or to make legally binding declarations on behalf of the other Party. Nothing in this Agreement shall be deemed to constitute a joint venture, agency, partnership, interest grouping, or any other kind of formal business grouping or entity between the Parties.

14.4.2. Neither Party shall be liable for acts of the other, nor the acts of any participating staff or students.

14.4.3. Neither Party shall make any promises, assurances, warranties or representations about the other Party other than as authorised by the other Party in writing.

14.4.4. Neither Party shall use or permit to be used, the name, insignia, logo or other distinctive identifying feature of the other Party, without the prior written consent of the other Party.

- 14.5. No one other than the Parties, their successors and anyone permitted to sign on their behalf have any right to enforce any of its terms.
- 14.6. No rights or obligations of the Parties arising from this Agreement may be assigned or transferred, in whole or in part, to any third Party without the other Party's prior formal approval.
- 14.7. Notices
Any notice or other communication given to a Party under or in connection with this Agreement shall be in writing, addressed to that Party at the address indicated in the header of this Agreement.
- 14.8. Amendments and modifications to this Agreement shall require a separate written agreement to be signed between the Parties.
- 15. Dispute resolution**
- 15.1. The Parties shall endeavour to resolve claims, disputes or other matters in question between them. Any such claim, dispute or other matters in question between the Parties that cannot be resolved shall be referred to the Parties' senior management or their legal representative. If senior management is unable to resolve such claim, dispute or other matter in questions within ten (10) days, or such longer period as they may specifically agree in writing, such claim, dispute or other matter in question shall be referred to arbitration.
- 15.2. The Parties hereby agree that any dispute, controversy or claim arising out of or relating to this Agreement, or the breach, termination or invalidity thereof, shall be finally settled by arbitration in accordance with the UNCITRAL Arbitration Rules as at present in force, expressly waiving their right to any other form of legal recourse.
- 15.3. The number of arbitrators shall be one (1).
- 15.4. The place of arbitration shall be the city of Braga (Portugal).
- 15.5. The language to be used in the arbitral proceedings shall be English.
- 15.6. All documents submitted in connection with the arbitration proceedings shall be in English language or, if in another language, accompanied by an English translation, which prevail from another language.
- 15.7. The arbitrator shall issue the award within three (3) months following the date of acceptance of the last of the arbitrations to act as arbitrator. Both Parties undertake to implement the arbitration award, which shall be final and binding.
- 16. Execution and Counterparts**
- 16.1. This Agreement may be executed in any number of counterparts, each of which when executed and delivered shall constitute a duplicate original, but all the counterparts shall together constitute the one agreement.



- 16.2. This Agreement may be executed using either a wet-ink signature, an electronic signature as set out in Regulation (EU) N°910/2014 on electronic identification and trust services for electronic transactions in the internal market (eIDAS Regulation).
- 16.3. No counterpart shall be effective until each Party has executed and delivered at least one counterpart to the INL.

IN WITNESS WHEREOF, the Parties have executed this Agreement electronically, and each Party may retain an electronic copy for its records.

CLIVIA M. SOTOMAYOR TORRES
Director-General by
INL

MÁRCIO PORTES DE ALBUQUERQUE
Director by
CBPF

Annex 1
PLAN of ACTIVITIES

Pursuant to Clause 2, the subject matter of this Agreement and the exact scope of the cooperation activities to be performed by the Parties is specified in the Plan hereof. This Plan shall be updated and/or supplemented on the basis of ongoing developments, which must be coordinated and signed by the Parties.

<p>Work scope</p>	<p>The scope of this collaboration includes theoretical and computational research activities in orbitronics and quantum transport, including project ideation, execution of research tasks, scientific publications and reports, as well as supervision and mentoring of researchers and students at INL.</p>
<p>Goals</p>	<p>The goal of this Agreement is to strengthen and consolidate joint research activities between INL and CBPF in the field of orbitronics, with a focus on orbital transport phenomena, orbital conversion mechanisms, and quantum transport in low-dimensional and mesoscopic systems.</p> <p>These activities are carried out within the scope of the projects “Orbital Engineering for Innovative Electronics (OBELIX)” - Horizon Europe - Pathfinder 10112964, and “ORBital-based electronics (ORBIS)” - Horizon Europe - MSCA Doctoral Network 101226840, both funded by the European Union.</p>
<p>Description of the Activities</p>	<p>The activities to be carried out under this Agreement include theoretical and computational research on orbital transport phenomena, such as the orbital Hall effect, orbital accumulation, orbital relaxation mechanisms, and orbital-to-charge and orbital-to-spin conversion in low-dimensional materials, multilayers, heterostructures, and mesoscopic devices.</p> <p>Within the scope of OBELIX, a Pathfinder project funded by the European Union, the Researcher Tatiana G. Rappoport acts as Principal Investigator and will lead theoretical and computational activities, including the development of theoretical models and large-scale real-space numerical simulations, as well as contributing to the interpretation of experimental results generated within the project.</p> <p>Within the scope of ORBIS, a project forming part of a Marie Skłodowska-Curie Doctoral Network funded by the European Union, the Researcher Tatiana G. Rappoport acts as Principal Investigator and will pursue foundational and methodological research in orbitronics, including the development of scalable real-space approaches applicable to systems with broken translational symmetry and disorder, as well as the supervision and training of early-career researchers.</p>

	<p>These activities will be conducted in close collaboration between INL and CBPF, including joint scientific publications, coordinated research planning, and shared supervision activities.</p>
<p>Description of the methods to be used</p>	<p>The activities will employ analytical theoretical modeling and advanced numerical methods for quantum transport, including real-space computational approaches suitable for large-scale, non-periodic, and disordered systems. The methods are designed to address orbital transport and conversion phenomena in realistic material geometries and device configurations</p>
<p>Staff</p>	<p>Tatiana G. Rappoport (CBPF) Hired staff at INL under the two projects</p>
<p>Financial provisions and costs to be supported by INL</p>	<p>Financial aspects related to the activities described in this Plan are governed by the specific funding rules of the OBELIX and ORBIS projects.</p>