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FutureChips

FutureChips

Postdoctoral Fellowship Programme

Guide for Evaluators

Call 1

Tampereen yliopisto
Tampere University

Co-funded by
the European Union

1 Introduction

1.1 About this Guide

This guide defines the principles, procedures and standards for evaluating FutureChips postdoctoral fellowship applications. It is intended for the external experts acting as evaluators s (forming the Evaluation Panels), interview panel members, Selection Committee members, Ethics Oversight Panel members and programme staff.

This "Guide for Evaluators" is intended for those participating in the FutureChips Evaluation and Selection process. The guide is also accessible to prospective applicants, ensuring transparency. Applicants can use this document as a checklist to enhance the quality of their applications, while evaluators may refer to the "Guide for Applicants" for further details. More information about this postdoctoral programme is available at FutureChips website.

The Guide provides general information about the programme, the application procedure, and the criteria for assessing individual candidates. The presented Guidelines for Evaluators are compliant with the European code of conduct for the recruitment of researchers, the European charter for researchers and with the ethical procedures and regulations of the European Commission. The evaluation of postdoctoral applications is carried out by three independent external experts (*evaluators*) and then ranked. The Selection Committee - chaired by an esteemed researcher external to Tampere University (TAU) - will review the ranking lists and consensus reports, ensuring proper procedures were followed and applying ex-aequo criteria if needed, before finalizing the selection.

Ethics experts in the selection committee will review the ethics self-assessment checklists and evaluators' comments of the ranked projects. The evaluation and selection process will comply with the requirements of 2025 MSCA COFUND Guide for Applicants.

1.2 About FutureChips

FutureChips is a new postdoctoral programme, co-funded by Tampere University and the European Commission under the MARIE SKŁODOWSKA-CURIE actions of Horizon Europe. FutureChips is co-funded by the European Union in the framework of the Horizon Europe Research and Innovation Programme under grant agreement Nº 101261075.

The programme runs May 2026 to April 2031 and offers **36-month fellowships** in the field of next-generation semiconductor technologies. The **20 Fellows**, recruited in two calls through a transparent, open, merit based and international selection process, will have the freedom to implement their individual and specific research topics within the broad scope of the programme, promoting scientific creativity, independent thinking, and breakthrough innovation. Research will be carried out at TAU, Finland's second-largest and most industry-engaged university, known internationally for excellence in photonics and chip design.

FutureChips will prepare the 20 postdoctoral researchers to become leaders in semiconductor science and technology. The fellows will benefit from interdisciplinary supervision, mentoring, and tailored career development. The programme offers advanced research training, inter-

sectorial secondments, and international mobility to deepen expertise in the field. The fellows will gain insight into the semiconductor value chain and the skills to turn scientific knowledge into innovation - preparing them for careers across academia and industry.

Applicants are offered to contact the Programme Manager before submitting their application in order to obtain information on availability of required research infrastructure. Applicants are free to select a primary academic supervisor and to contact this person regarding their research plan. The primary academic supervisor chosen by an applicant is not involved in the evaluation and selection of the respective applicant.

The postdoctoral fellows will have access to excellent **research infrastructure** on local and national levels to support their research. Research infrastructure is described on the webpages of FutureChips and Tampere University. Applicants must plan their research based on availability of research infrastructure by the research group of the chosen supervisor.

Thus, applicants are instructed to check the match of their Research plan with the Research area selected (one out of four), the primary academic supervisor (listed under the selected Research area, see below), and the required versus available Research infrastructure.

Any questions applicants might have concerning Research infrastructure should be addressed to futurechips@tuni.fi.

1.3 Selection Committee

The Selection Committee (SC) being integrated by a combination of internal and external members (to be approved by the Steering Board).

SC Chair: Prof. Lars Montelius (Prof Emer. Lund University, Former Director-General of the International Iberian Nanotechnology Laboratory).

SC members: Emanuele Pelucchi (external expert, Tyndall National Institute), Dr. Pauli Kuosmanen, (Programme Coordinator, Director of Research and Innovation Services at TAU), Dr. Anu Juslin (Head of Research Development at TAU), Dr. Chiara Fedele (MSCA Specialist at TAU) and after the first recruitment round one (1) fellow.

The SC oversees the selection process, including the eligibility check, selection and appeals. The SC will conclude the selection process based on the Evaluation Panel (EvP) and the Interview Panel (IP) reports, approving the final ranking, elaborating a final report and delivering the Steering Board (SB) with a final list of the candidates to be selected. The SC is supported in the administration and implementation of the call by the Programme Manager (PM) and the Programme Management Team (PMT).

2 Selection and commitment of evaluators

The evaluators will be identified from European and international organisations and will be selected to fit the scientific scope of the submitted applications. FutureChips has created a

Central Expert Database, i.e. a pool of international experts, from which the PMT will propose a set of three (3) experts to be assigned to each application – forming the Evaluation Panel for the application. To ensure a high degree of relevance, evaluators will be matched - to the extent possible - to applicants based on alignment with the specific scientific or technological focus of each application. To the extent possible, gender balance will be ensured in the composition of evaluation panels.

The Selection Committee (SC) will formally select the external evaluators.

Recruitment of external experts to act as evaluators starts at least 2 months before the call deadline to ensure timely commitment. Recruitment of external experts may continue after the call deadline as needed to implement the foreseen evaluation process.

2.1 Criteria to select external independent experts

All experts must have at least 10 years of professional experience.

All experts must have strong and broad knowledge of the applicant's wider research area.

Academic experts must have published at least 20 peer-review publications and must hold a status of an associate professor or above.

Non-academic experts must have R&I experience. All experts should demonstrate experience in similar programmes, namely recruitment and selection processes and/or evaluation of interdisciplinary and inter-sectoral research projects.

To ensure the independence of the evaluations by the external experts, experts, having recently co-authored publications with any of the listed academic supervisors of the programme's research areas, are not invited to serve as evaluator (see Annex 1 of this Guide for Evaluators).

2.2 Obligations

The external experts (*evaluators*) evaluate eligible applications on a personal basis, not as representatives of their employer, their country or any other entity. They are expected to be independent, impartial and objective, and to behave in a professional manner throughout the process. For this reason, a summary of the individual evaluation reports will be communicated to the applicants in order to justify the decision (without revealing the evaluator's identity).

Before commencing their work, evaluators will have to read and accept a non-disclosure agreement of confidentiality (the signed "Agreement for Participating in Evaluation of Applications submitted to FutureChips") and the conflict of interest (Annex I of this Guide for Evaluators). The agreement requires experts to maintain strict confidentiality with respect to the entire evaluation process, during and after the evaluation.

All experts are advised to view short instructional videos (YouTube) regarding responsible research and researcher assessment, which have been created by the CoARA ExPECT project with TAU as partner.

How to assess the quality of research

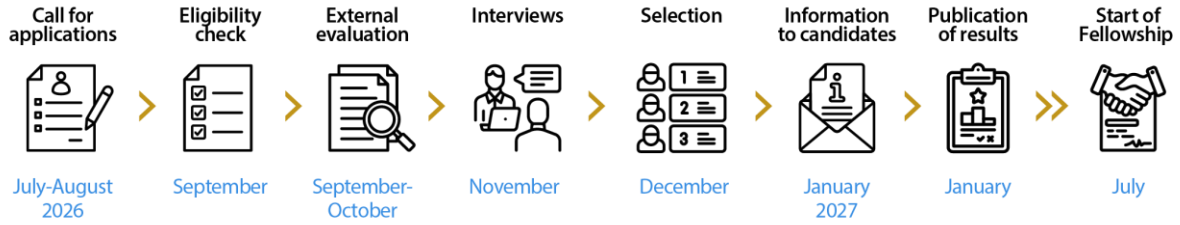
Evaluator's instructions - Assistant professor and Postdoctoral researcher

Under no circumstance may an evaluator attempt to contact an applicant (regarding the application) on his/her own account, either during the evaluation or afterwards.

2.3 Conflict of Interest

Experts invited to evaluate an application will receive with the invitation the applicant's name, latest affiliation and researcher ID, eg ORCID. If an expert identifies a conflict of interest (see Annex 1), the expert must immediately inform the PMT. Likewise if such conflicts become apparent during the course of the evaluation.

3 Timeline of the 1st Call:



The planned timeline of the 1st call of FutureChips is the following:

Call opening: 1 July 2026 at 14.00 (EEST, UTC+3)

Call closing: 31 August 2026 at 23.59 (EEST, UTC+3)

Eligibility check: 1 September to 4 September 2026

Allocation of external experts to applications: 7 September to 18 September 2026

Evaluation by external experts: mid September to late October 2026

Online interviews: 9 November to 20 November 2026

Information to applicants: December 2026

Publication of results: January 2027

Start of projects: 1 July 2027 (latest)

Any change to this expected timeline will be announced on the FutureChips website.

4 Evaluation

4.1 Eligibility criteria

To be eligible for the programme, the applicant must:

Criteria assessed prior to peer-review evaluation

- **have a doctoral degree** in a relevant field (e.g. future electronics, electrical engineering, photonics, micro- and nanotechnology, semiconductor physics, advanced materials, or chip design) by the application deadline of 31 August 2026. Applicants who have successfully defended their doctoral thesis by 31 August 2026, but who have not yet formally been awarded the degree are also eligible to apply. In such cases, the applicant must provide confirmation that the doctoral degree will be awarded at the latest upon starting the employment.
- **have not** resided or carried out their main activity (e.g. work, studies) in Finland for more than 12 months in the 36 months immediately preceding the application deadline (31 August 2026).

Criteria assessed in the peer review evaluation including online interviews

- have the ability to pursue independent scholarly activity.

have fluent spoken and written English skills.

4.2 Application and selection process

In the first call, **12 postdoctoral fellows** are recruited. The selection process is divided into the following phases:

1. **Eligibility check.** All applications will be subject to an eligibility check conducted by the Project Management team. Applications not fulfilling the eligibility criteria (see below) will be rejected. Ineligible applicants will be informed within 1 week of the outcome and the process for appeals (see 'Rebuttal opportunities'). Eligible applications will proceed to the next phase.
2. **External evaluation.** Three independent experts (i.e. the Evaluation Panel) selected for each application will conduct an evaluation remotely and each will prepare an Individual Evaluation Report (IER). Each expert will assess the application independently, using the three evaluation criteria defined in the call: Excellence, Impact, Implementation, with a scoring scale from **1 to 6** (see 'Evaluation criteria'). Experts will also be instructed to identify any potential ethical concerns regarding the research plan or applicant (to be considered during the final Ethical review, see below). After individual scoring, the Evaluation Panel will agree on the final score and comments.

One EvP member will be appointed by the SC Chair as rapporteur, tasked with coordinating the EvP's feedback and representing its collective view. Where there is a significant difference in the scoring (3 points or more for a criterion) between evaluations of the same application, a Consensus Committee will be assembled online. In line with MSCA practice, the consensus committee will comprise of the external evaluators assigned to that application, one of whom will act as rapporteur and be responsible for preparing a Consensus Report at the end of the process. If necessary, the SC Chair may act as facilitator to help reach consensus.

Cross-reading between the four research areas' application is envisaged as a horizontal quality-assurance measure aimed at ensuring maximum consistency across EvPs/research areas and mitigating potential calibration effects arising from parallel evaluation streams. The exercise will provide an opportunity for peer validation of scoring approaches, facilitate convergence in the interpretation of award criteria, and contribute to the overall robustness of the ranking process. In line with established good-evaluation practice, cross-reading is expected to enhance comparability of outcomes, strengthen confidence in the evaluation results, and provide additional assurance that proposals of similar merit receive equivalent treatment irrespective of panel allocation. This approach ultimately supports the integrity, transparency and credibility of the evaluation process and its outcomes.

The SC will confirm the number of top ranked and lowest ranked applications to be included in the cross-reading. The SC will implement and oversee the cross-reading.

Based on the final scores, the PMT will produce a ranking list.

Following the "*Commission Recommendation of 03 October 2023 on critical technology areas for the EU's economic security for further risk assessment with Member States*" Tampere University will review applications of top ranked candidates regarding research security.

The highest ranked candidates (**2x number of open positions**) are informed and will proceed to online interviews. Rejected Applicants are informed by the PMT via email, with the possibility for rebuttal on procedural errors or factual inaccuracies.

3. **Interviews.** The Interview panel (IP) will conduct the online interviews, being integrated by 2 members of the EvP plus a research group leader at TAU knowledgeable in the research area selected by the applicant. This will exclude the primary academic supervisor selected by the applicant. The online interview might also be attended by the Programme Manager, a HR specialist at TAU and the SC Chair as observers. Calendar reservations for the interviews will made with all evaluators at the moment they are selected (see EvP) to ensure their availability for the IP. The interviews will take place online. Each interview will last for 25 minutes, following a structured format: a 10-minute presentation by the candidate followed by 15 minutes of Q&A. The 10 minutes presentation by the candidate shall include their research project, their professional profile and expertise. The presentation shall consist of around 5 slides. Candidates will be assessed against the evaluation criteria (see 'Evaluation criteria'). The interviews will take place remotely via a secure video connection, technically organized by the

TAU. The entire process will be conducted in English. All IP members will assign individual scores, and a consensus score will be forwarded to the PMT.
Prior to the interview, candidates and IP members will receive interview guidelines including format, expectations, and evaluation focus areas.

4. **Final ranking and selection.** At the end of the interview process, a final assessment of the candidates will be made considering the score obtained in the interview and the score obtained in step 1. The PMT will collect all the evaluations and create a consolidated ranking list of candidates for the positions. After the interviews, the PMT will prepare a second overall ranking list, combining the external evaluation (weight: 60%) and interview results (weight: 40%). Applications with flagged ethical concerns will be reviewed by the Ethics Oversight Panel, and recommendations will be integrated into the final decisions. The final ranking list will classify applicants into: a) Main list: selected applicants; b) Reserve list: next 5 highest-ranked candidates, who may be offered a position if any applicant on the main list declines the offer, or if any of the main list applications fail to meet the programme ethical standards; c) Not approved: candidates who will not be offered a position.
5. **Ethics review**: Pre-interview: The Ethics Oversight Panel will assess the nature and severity of the ethical issues flagged by the applicants and/or the Evaluation Panel **only for applicants with a score high enough to merit consideration to be invited to the interview** (2x number of open positions). Candidates will receive the report prior to the online interview. Post-interview: If the Interview Panel identifies new ethical issues or assesses that the candidate has not resolved ethical concerns adequately during the interview, the Ethics Oversight Panel will review the ethical issues for the candidates being on the Main list and the Reserve list. The shortlisted candidates will be informed by email and will have 5 working days to provide to a resolution of the ethical issues.
6. **Informing the candidates.** Applicants on the reserve list will be informed of their ranking. Unsuccessful applicants (including those on the reserve list) will be provided with information on the rebuttal procedure. Selected candidates will receive a formal acceptance letter, including their rank, offer details, and instructions on confirming acceptance. **Candidates will have up to 2 weeks to confirm the acceptance of the position**. If no response is received after 2 weeks, a follow-up will be sent, with a request for acceptance within 3 working days. If no confirmation is received within this period, the offer will be made to the next person on the reserve list.
7. **Rebuttal opportunities.** Applicants may request redress – based on procedural errors or factual inaccuracies – **within 1 week of being informed** of: 1) their eligibility check; 2) the external evaluation outcome; 3) the final ranking. Applicants will be provided with a one-page form for this purpose. The appeal email should have as subject "**Redress_FutureChips_[Surname]_[Firstname]**" and clearly state the reasons for the appeal and should be sent to futurechips@tuni.fiThe PMT will either re-check eligibility (within 3 days) or forward the appeal to the Redress Committee. If required, three new external evaluators will re-evaluate the application within 2 weeks. These evaluators will produce new individual reports and a new final score. A revised

evaluation report will be issued, and the application will be re-ranked. All applicants affected by the change will be notified. No further rebuttals will be accepted.

Publication of results. Once final decisions are confirmed and the positions formally accepted by the applicants, the names and project titles of the selected researchers will be published on the FutureChips website for transparency.

4.3 Access to the applications

All applications are exclusively submitted to and accessed for evaluation in the LAURA-system at TAU. Evaluators must securely handle the applicants. After the evaluation process is completed, evaluators will be reminded to fully delete the application and related documents from their devices/servers/etc.

4.4 Evaluation Criteria

Evaluation criteria and respective weights implemented during the remote evaluation by the Evaluation Panel. Weighting is only for the ranking of evaluated applications advancing to online interviews. Evaluators will be offered tools to facilitate the evaluation.

Evaluation of the application	
Evaluation criterion (weight)	Specific aspects to be assessed (specific weight %)*
1. Excellence (50%)	**1.1. Excellence of the applicant (CV) (25%)**
	Academic merit: 1. Awards/honours (e.g., scholarships, prizes); ***2. scientific publications*** (quality of content) and conference presentations; 3. teaching, supervision and leadership experience; 4. International experience and engagement in networks at international level; 5. Participation/management of research projects; 5. Public engagement, knowledge transfer, patents or technology transfer experience; 6. Other relevant competences.
	1.2. Excellence of the proposed research (25%)
	Research excellence: 1. Quality and credibility of the proposed research project, including: a) Originality, level of novelty, and innovativeness; b) Theoretical and methodological framework; c) Consideration of interdisciplinarity and gender aspects; 2. Quality and appropriateness of the proposed training and two-way transfer of knowledge between the researcher and the host; 3. Complementarity and relevance of the supervisor(s) and research group(s) in relation to the proposed project.
2. Impact of the proposed research (30%)	1. Potential to result in significant new scientific breakthroughs; 2. Magnitude and importance of the project's contribution to the expected scientific, economic and societal impacts; 3. Potential to enhance the applicant's future career prospects; 4. Quality of the proposed measures to exploit and disseminate the project results, and to reach different target audiences, both within and outside academia.
3. Implementation of the proposed research (20%)	1. Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources and risk management; 2. Appropriateness of the research infrastructure; 3. Feasibility of completion within the 36-month duration of the fellowship.
Evaluation at the interview stage: Weighting is only for the ranking of interviewed applicants.	
Evaluation criterion (weight)	Specific aspects to be assessed
1. Scientific command (70%)	Ability to explain the expected outcome, scientific and societal impact of her/his proposed research project during the interview. Clarity of ambition.
2. Communication skills (30%)	Communication skills, ability to defend her/his project during the interview.

*Underlined Specific aspects paramount to achieving the FutureChips programme's objectives.

Submitted Application - What to evaluate

- the applicant's academic merits and demonstrated excellence,
- the quality and scientific excellence of the research project,
- the feasibility, impact, and implementation of the research project,

the scientific relevance and significance of the proposed research topic,

Online interview – What to evaluate

- Ability to demonstrate ownership of the research idea and ability to explain the expected outcome, scientific and societal impact of the proposed research. Clarity of ambition.
- Communication skills, ability to defend her/his project during the interview.
- English skills

Overall, evaluators should reflect on:

- the quality of the applicant's articulation of the chosen research question
- the quality of the applicant's articulation of the societal relevance and significance of a successful project

4.5 Scoring and Threshold

To produce the final ranking, the PMT considers the overall scores provided for each application by the EvP and the IP (weighed average 60% EvP; 40% IP).

The applied reviewing and scoring methods are based on those of the Research Council of Finland. For each of the criteria above, evaluators will be asked to provide: i) a (full) score between **1 (lowest) and 6 (highest)** and ii) comments for the IER and after the online interview. In addition to the criteria scoring, evaluators will also be asked to provide an assessment of the strengths and weaknesses of the research application as a whole. The total maximum score for each phase is 6. Evaluators will also be instructed to report ethical concerns.

In the Evaluation Report prepared by the rapporteur and after the interview the IP may use scores of 0.5 steps in the scoring to best represent the joint assessment of the individual evaluators.

The score scale, applicable both at the remote evaluation and interview stage, is as follows:

6. Outstanding | Exceptional quality and clarity; far exceeds expectations with no identifiable weaknesses.

5. Excellent | Highly convincing and well-articulated; no significant elements to be improved.

4. Very good | Strong overall with a few minor areas for improvement.

3. Good | Adequate, but with clear room for improvement in quality, clarity, or coherence.

2. Satisfactory | Meets basic expectations but has significant weaknesses or gaps.

1. Poor | Fails to meet core criteria; major weaknesses in substance or presentation.

4.6 Meaning of qualifiers

Positive qualifiers

'Outstanding' - 'excellent' - 'very good' - 'good'

'Outstanding' for the criterion EXCELLENCE refers to a research plan that is clearly at the frontier of knowledge and demonstrates the highest level of scientific excellence. A score of '6' for a criterion would be appropriate when at least one 'outstanding' qualifier is used; otherwise score '5.0' – ie. 'excellent'.

Negative qualifiers

A 'minor shortcoming' → issue relating only to a marginal aspect of the application with respect to the criterion and/or can easily be rectified (it will not impact the scoring).

▪ A 'shortcoming' → problem relating to an important aspect of the application. It impacts the scoring, i.e. the application is still expected to lead to useful results with positive impact.

▪ A 'significant weakness' → application addresses the criterion in a limited and/or not sufficiently effective way (lowering score to 1 (Poor)).

4.6.1 Guidance for evaluators

Evaluators are requested to evaluate applications in an impartial and consistent manner, irrespective of the origin or identity of the applicant. Evaluators are required to evaluate the application as submitted. Evaluators should avoid to give recommendations, opinions or to make assumptions. Evaluators should avoid to summarise the application in their Individual Evaluation Report (IER).

Career breaks (due to parental leave, extended sick leave, etc.) should not be viewed negatively nor have any bearing on the overall evaluation of the merits of the applying researcher.

Evaluators must list strong and weak points based on the given sub-criterion; everything that is included in the Individual Evaluation Report (IER) must be briefly justified.

Substantiate your assessments, in particular negative ones (why is it a shortcoming?).

Evaluators are advised to use the whole range of full scores (1-6). Evaluators should approach the scoring by starting with 3 (Good | Adequate but with clear room for improvement in quality, clarity, or coherence, i.e. the criterion is addressed well, but a number of shortcomings are present.) and formulate their arguments to justify grading the application higher or lower. The scoring must be accompanied by a qualifier. Thus, the score must be justified by expressing strengths and weaknesses (with the term 'because', at least for the critiques). Comments need to be consistent with the given score. The score should reflect not only the number of weaknesses but also the severity of the weaknesses or the level of the strengths.

Comments must match scores. Evaluators should focus on content first i.e. the comments, then on scores. Thus, only to score after commenting.

Evaluators must avoid double penalisation across criteria.

4.7 Recommendations to the Evaluators for scoring and developing the Individual Evaluation Report

Do not use:

Journal-based metrics such as journal impact factor (JIF).

Journal's reputation as a proxy of an article's quality.

h-index and other similar indices based on citation counts, even if standardized, e.g. for academic age.

The comments should:

Be specific to the relevant criterion addressing each sub-criterion.

Be affirmative.

Provide clear and well-supported justifications.

Avoid generalisation and categorical statements, especially if negative, such as: "The proposed research project is good/poor".

Be consistent with the score awarded, which must reflect strengths and weaknesses.

The comments should not:

Contain recommendations or suggestions to improve the application.

Be discriminatory, offending, or inappropriate, like "The research could have been described better".

Be based on assumptions, suggest ignorance or doubt.

Contain factual mistakes.

4.8 Ex aequo:

In cases where 2 applications are tied (ex aequo), a final ranking decision is made by the SC by inspecting the individual scores and statements provided by each reviewer and by

prioritising i) higher score in criterion 1.1 (excellence of applicant); ii) researchers at risk, iii) special needs, iv) gender balance.

5 Step-by-step process

- In early September 2026, the external expert, having signed the required agreement, and SC having approved match of expert and application, is invited by the PMT to be a EvP member and to evaluate an application.
- Within 3 working days, after reviewing the *project summaries and the applicants name and current affiliation*, the expert notifies the PMT of any possible conflict of interest.
- The expert completes an online training (45 min, live or recorded). Invitation to the online live training scheduled for 10 September 2026 will be emailed in early August 2026. The expert familiarizes him/herself with the assessment criteria.
- In the absence of a conflict of interest (relationship to the applicant), the expert is granted access to the application in the LAURA-system and the Tampere University Teams-folder for the respective application.
- The expert evaluates the application within 10 working days.
- The expert informs by email the PMT about completion of the IER. The expert uploads the IER to via the respective Teams-folder. *This step is scheduled to be completed by 25.9.2026*.
- Where there is a significant difference in the scoring (3 points or more for a criterion) between evaluations of the same application, a Consensus Committee will be assembled online.
- The expert timely answers requests for clarification which the rapporteur might have.
- The expert accepts the Evaluation Report (ER) prepared by the rapporteur and uploaded to the respective Tampere University Teams-folder created for the very application. *This step is scheduled to be completed by 14.10.2026*.

Online interview – step-by-step:

- The PMT invites the expert to join the online interview (2 of the 3 EvP members will join). *The interviews are scheduled for 9.-20.11.2026*.
- The expert familiarizes him/herself with the assessment criteria, the Evaluation Report and if given the Ethical issues of the application.
  The expert joins the IP and as IP member provides a score right after the interview.

The expert deletes offline copies of the application and related documents, at the latest in January 2027.

6 Redress

The Redress Committee (RC) is activated only in cases where procedural errors or factual inaccuracies are identified.

7 Ethics

The programme has a dedicated Ethics Oversight Panel (EOP). Applications with self-declared ethical issues, or deemed by the evaluators to contain these, which also receive an evaluation score high enough to merit consideration to be invited to the Interview, will be submitted to the EOP. The EOP will consider whether the applicant has addressed ethical questions adequately (hereafter referred to as EOP review). The EOP review is based on guidelines by the Finnish National Board on Research Integrity TENK as well as relevant legislations such as GDPR. For each review, Dr. Ville Rantanen at TAU will act as rapporteur and be responsible for preparing a short report, detailing the EOP's recommendations to resolve the ethical issue. This will be added to the application by the PM and communicated to applicants invited to interviews. Applicants will be asked to briefly respond to the EOP's report. If during an interview not earlier flagged ethical issues are noticed by the IP, the EOP will review the issue as described above. The procedure is designed to support the resolution of ethical issues of excellent research ideas, while the responsibility for implementing ethical practices remain with the researchers.

8 Application

Application and the two required documents

At Tampere University, recruitment to open positions is managed in the LAURA online recruitment system. Thus, all mandatory documents are submitted via LAURA. **Applications and all accompanying documentation should be written in English and in PDF format only**. If the original documents are not in English, official translations into English are required. Applicants must answer all questions given in LAURA and upload the mandatory documents to LAURA.

In LAURA, applicants have to upload the following separate documents:

1. **Doctoral degree certificate** (if unavailable, a copy of official confirmation of the successful completion of the doctoral studies and doctoral defence). Please provide the certificate in the original language and also with the official translation in English (if original language is other than Finnish or English) (max 5 MB)
2. Attach the following content mentioned below combined as only one (1) PDF file **using the template with more detailed instructions provided on the FutureChips website**. (max 10 MB):
    i. **Research Plan Abstract**
    ii. **Research Plan**
    iii. **Curriculum Vitae**

iv. **List of publications**
v. **Ethics self-assessment**
vi. **Motivation letter**

Applicants are strongly encouraged to participate in non-academic secondments and must indicate their preferred secondment options in the application. All documents must be submitted in English. If the original documents are not in English, official translations into English are required. **Only complete applications will be considered**.

Ethical guidelines

All candidates are required to submit the ethics self-assessment based on the Horizon Europe guidelines available at: how-to-complete-your-ethics-self-assessment_en.pdf (europa.eu)

All key actors will adhere to Tampere University's ethical and legal standards, and all key steps will be adequately documented. Tampere University fully complies with the Finnish law with regards to the processing of applicants' documentation (*Act on the Openness of Government Activities (621/1999*), as well as *EU Regulation 2016/679 on General Data Protection*). Application and review documents will be treated as confidential and stored on a secure server with access limited to authorized personnel.

9 Research areas and primary academic supervisors

The fellows are given the opportunity to select their host research group and to design their own research project addressing the programme's **four interconnected semiconductor research areas**:

1. **Advanced materials**

   Advanced III-V compound materials and hybrid photonic-electronic heterostructures for cutting edge electronic, sensing, optical, photonic and quantum devices. This area includes also the fabrication of advanced classes of hybrid materials for electronics and optoelectronics including advanced processes for handling semiconductor-dielectric-metal interfaces.

   Examples of emerging scientific topics in this area:

   - Material sciences: advanced epitaxy of GaSb-based heterostructure for mid-IR photonics applications; monolithic integration of III-V/Si and III-V/oxide interfaces; advanced GaSb quantum-dot systems.
   - Advanced integration processes: novel front-end and back-end processes enabling full scale vertical integration of hybrid chips. New processes enabling micro-transfer printing of III-V thin-film devices to CMOS compatible substrates, and laser assisted bonding enabling alignment of photonics/microelectronics chips with sub-micron precision.

- Hybrid microsystems: demonstration of functional building-blocks for quantum communication (quantum key distribution) and on-chip integrated sensors for biomarkers (e.g. glucose, core-body temperature etc.).

Supervisors:

Prof Mircea Guina
Prof Goery Genty
Prof Robert Fickler
Prof Regina Gumenyuk
Prof Laeticia Petit
Prof Juha Toivonen
Prof Mika Valden

2. Novel architectures

Novel architectures will provide new opportunities in the era where we approach the physical limits of traditional computing technologies, especially dealing with big data and artificial intelligence (AI) workloads. This area comprises Near or In-Memory Computing; Neuromorphic Computing; Cryogenic Electronics for Quantum and Space applications.

Examples of emerging scientific topics in this area:

- Advanced Next Generation Chips for Unconventional Computing: Neuromorphic Computing – 3D-monolithically or heterogeneously integrated neuromorphic chips with multiple functional units like optical and touch sensing, memory and logic for Near and In-sensor computing with ultralow power operation.
- For Quantum and Space applications, development of power-efficient cryogenic and radiation-hardened memory technologies together with solid state cooler technologies, leading to zero emission refrigeration on-chip.

Supervisors:

Asst. Prof Mohsin Abbas
Prof Robert Fickler
Adj. Prof Mikko Huttunen
Asst. Prof Sergey Kruk
Prof Pekka Jääskeläinen
Prof Sayani Majumdar
Assoc. Prof. Tapio Niemi
Prof. of Practice Markku-Juhani Saarinen
Asst. Prof Vishnu Unnikrishnan

3. Chip design

The emphasis of this research area is on System-on-Chip (SoC) and chiplet design methodologies, tools and software support. Advanced design methodologies that can handle both electronic and photonic components are another focus area. Ensuring that designed chips are secure from vulnerabilities and attacks is a growing concern which is an

important research track. Within the global political climate, the importance of maintaining and growing local chip design know-how cannot be prioritized too much given the pivotal role computer chips play in our modern society. Designing and verifying ultra-low power low latency chips which are secure and reliable at the same time is a grand technical challenge.

Examples of emerging scientific topics in this area:

- Utilization of AI in the chip design process.
- Advanced simulation tools to model system behaviour and validate designs before implementation.
- Design of efficient AI inference-capable chips.
- Security and reliability in customized ultra-low latency computing.
- Design of application specific integrated circuits (ASIC) for edge computing.

Supervisors:

Asst. Prof Mohsin Abbas
Prof Timo D. Hämäläinen
Prof Pekka Jääskeläinen
Asst. Prof Alexandre Mercat
Assoc. Prof. Tapio Niemi
Prof Karri Palovuori
Prof. of Practice Markku-Juhani Saarinen
Asst. Prof Vishnu Unnikrishnan
Prof Mikko Valkama
Prof Jarno Vanne
Asst. Prof Han Zhou

4. Advanced packaging

Advanced packaging drives significant improvements in performance, efficiency, and functionality. Thus, it is transformative for the semiconductor industry. This area focuses especially on System-in-Package (SiP), 3D integration and advanced materials (for instance advanced substrates and interconnects are crucial for improving thermal management and electrical performance in advanced packaging). Chips of interest include CMOS, photonics, power electronics, and Micro-Electro-Mechanical Systems (MEMS).

Examples of emerging scientific topics in this area:

- Additive manufacturing presents transformative potential in microelectronics packaging by enabling high-precision, multi-material deposition at micro- and nanoscale resolutions. Challenges include the development of advanced functional materials such as conductive, dielectric, and thermal interfaces optimized for high-resolution printing like aerosol, superinkjet printing, and microdispensing.
- Flexible, stretchable, and conformal electronics represent a rapidly advancing frontier with transformative implications for wearable devices, biomedical systems, soft robotics, and next-generation human-machine interfaces. Challenges lie in the

design of novel materials (e.g. stretchable conductors, elastomeric substrates, biocompatible semiconductors) and architectures.

- Co-design and heterogenous integration: additive manufacturing with novel materials and form factors are driving new paradigms in heterogenous integration, miniaturization of interconnects, 3D SiP architectures, offering enhanced performance, reduced form factor, improved thermal performance, and lower production costs.

Supervisors:

Prof Mircea Guina
Prof Matti Mäntysalo
Prof Juha Toivonen
Assoc. Prof Jukka Viheriälä
Asst. Prof Han Zhou

10 Non-academic secondments

The postdoctoral fellows are expected to undertake at least **one (1) secondment in the private sector** (2-6 months). To this end, and to include the semiconductor sector's perspectives and experiences in trainings, the programme collaborates with following associated partners:

- Tuotekehitys Oy Tamlink, Finland
- Business Tampere Oy, Finland
- Silicon Austria Labs GmbH, Austria
- Institute SiNANO Association, France
- Solinide Photonics Ab, Sweden
- Aumovio SRL, Romania
  SisuSemi Ltd, Finland

11 Training and career development offerings

Scientific training: Fellows will carry out their research within leading research groups at TAU, guided by a dedicated Supervisory Team. Fellows will improve their scientific skills by leading their research project (training-through-research), which will provide them with an opportunity to work closely with academic supervisors and non-academic mentors, engage in secondments across sectors, and collaborate within international research networks.

Transferable skill training: Fellows will be offered a comprehensive portfolio of transferable skills training, preparing them for diverse career paths. To consolidate their learning and develop their leadership skills, fellows will be encouraged to co-supervise MSc and PhD students within their host research group. Transferable skill training will be further reinforced by targeted activities at network-wide events, all designed to promote scientific and transferable skill development, promote interdisciplinary collaboration, support intersectoral and international exposure, and foster networking among fellows and participants. The network-wide events will start with an Onboarding event to allow fellows to meet each other

and the whole FutureChips network, become familiarized with essential programme information and institutional orientation, as well as training options available. Monthly meetings and bespoke trainings for fellows will be organized.

Intersectoral exposure is an integral component of FutureChips, allowing fellows to benefit from mentoring and mobility to non-academic organisations, ensuring they develop the competences needed to work across sectors and lead future R&I initiatives.

Annex 1 Conflict of interests

Conflict of interests – Tampere University

TAU defines conflicts of interests as: - Close collaboration with the applicant (e.g. co-authorship over the **past 3 years**; involvement in the preparation of the application and/or in the exploitation of research results). - Occupies or has occupied a position of a superior, subordinate or instructor to the applicant. - Concurrent application for the same post as the applicant. - Close association with the applicant (e.g. spouse, child, sibling, de facto or otherwise, or close friend).

Conflict of interests – Horizon Europe Grant Agreement Article 12

The beneficiaries must take all measures to prevent any situation where the impartial and objective implementation of the Agreement could be compromised for reasons involving family, emotional life, political or national affinity, economic interest or any other direct or indirect interest (‘conflict of interests’).

They must formally notify the granting authority without delay of any situation constituting or likely to lead to a conflict of interests and immediately take all the necessary steps to rectify this situation.

The granting authority may verify that the measures taken are appropriate and may require additional measures to be taken by a specified deadline.