# FAroGels

## MSCA Doctoral Network

# DOCTORAL CANDIDATE POSITION

## DC[11] – Aerogels from Plant Residues as Active Absorbent Pads for Food Packaging

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| **Position** | DC11 - Aerogels from Plant Residues as Active Absorbent Pads for Food Packaging |
| **Project** | FAroGels – Food-Grade Aerogels for Sustainable Food Systems |
| **Funding programme** | Horizon Europe – Marie Skłodowska-Curie Actions Doctoral Networks (HORIZON-MSCA-2025-DN-01-01) |
| **Grant Agreement number** | 101312450 |
| **Recruiting/Host organisation** | University of Udine, Department of Agriculture, Food, Environmental and Animal Sciences, Udine, Italy |
| **PhD awarding institution** | University of Udine, Department of Agriculture, Food, Environmental and Animal Sciences, Udine, Italy |
| **Type of contract** | Fixed-term employment contract, 36 months |
| **Job status** | Full-time (100%) |
| **Application deadline** | 09 December 2026, 23:59 (CET) |
| **Expected start date** | March 2027 (earliest) |

## About FAroGels

**FAroGels – Food-Grade Aerogels for Sustainable Food Systems** is a Marie Skłodowska-Curie Actions Doctoral Network funded by the European Union under Horizon Europe. The network brings together academic and non-academic partners with complementary expertise in food science and technology, materials science, biopolymer science, biotechnology, process engineering, analytical characterization, packaging and sustainable innovation. **FAroGels** aims to develop, characterize and validate food-grade, bio-based and biodegradable aerogels for sustainable food systems. The network will investigate how these highly porous materials can support more efficient food processing, improved food quality and safety, nutritional and sensory functionality, protection and delivery of bioactive compounds, and sustainable packaging solutions.

## Position Description

This position forms part of the **FAroGels** research program on food-grade, bio-based, and biodegradable aerogels and their application in sustainable food systems. The selected candidate will be employed by **the** University of Udine and will be required to enroll as a PhD student at the University of Udine, in accordance with the relevant admission and enrolment requirements.

The doctoral project will focus on:

- Underutilised plant residues from food processing will be converted into biodegradable aerogels to be used for the development of active packaging solutions able to extend food shelf life, aligning with circular-bioeconomy goals. Residues will be transformed into porous aerogels (particles or monoliths) via solvent exchange and supercritical $CO_2$ drying. Aerogels and aerogel-based packaging solutions will be functionalized (e.g., coating) to modulate surface properties thus influencing their capacity to: (i) absorb food exudates and/or undesired volatile compounds; (ii) load natural antioxidant/antimicrobial compounds; (iii) provide a controlled release of the active substances in the food or in the head-space of the packaged food. Multi-technique characterization (e.g., SEM, BET, DSC, mechanical tests, wettability, colour/odour stability, composition, MR profiling with DC3, water/oil uptake) will guide structure–function optimization. Absorption behavior, release kinetics, and compliance with packaging regulation will be also assessed. Performance will be validated with real foods (e.g., meat, fruits, vegetables), monitoring the changes in hygienic (e.g., total viable count, yeast and moulds) and quality indicators (e.g., peroxide

values, consumer acceptance), supported by shelf-life modelling. Biodegradability could also be assessed to evaluate the sustainability potential of the developed materials. Two academic and two non-academic secondments have been planned during the project.
- The position will involve laboratory-based research, data analysis, scientific communication and close collaboration with other FAroGels Doctoral Candidates, supervisors and partner organizations.

## Supervisory Team

The Doctoral Candidate will be supervised by a team combining academic and non-academic expertise:

| Role | Name | Organisation | Country |
|---|---|---|---|
| **Main supervisor** | Dr. Stella Plazzotta | University of Udine (UNIUD) | Italy |
| **Academic co-supervisor** | Dr. Sonia Calligaris<br>Prof. Stefano Farri | University of Udine (UNIUD)<br>University of Milan (UNIMI) | Italy |
| **Industry supervisor** | Dr. Vincenzo De Tata | Barilla G. e R. Fratelli SpA (BRL) | Italy |

## Planned Secondments

As part of the training programme, the Doctoral Candidate will complete planned secondments at FAroGels partner organisations:

| Host organisation | Sector | Country | Duration |
|---|---|---|---|
| Middle East Technical University (METU) | Academic | Türkiye | 2 months |
| University of Milan (UNIMI) | Academic | Italy | 2 months |
| aerogel-it GmbH (AIt) | Non-academic | Germany | 1 month |
| Aerofybers Technologies S.L. (AFyb) | Non-academic | Spain | 2 months |

## Main Responsibilities

The Doctoral Candidate will be expected to:
- Conduct research on biodegradable aerogel-based packaging solutions able to extend food shelf life, produced up-cycling underutilized plant residues from food processing.
- Plan, perform, document and analyse experimental work using relevant laboratory, analytical, processing and/or modeling methods.
- Collaborate with academic and non-academic partners across the FAroGels network, including during the planned secondments.
- Participate actively in FAroGels network meetings, training schools, workshops and transferable-skills activities.
- Prepare scientific reports, contributions to project deliverables, presentations and publications, and contribute to dissemination and communication activities.

## Requirements

- **Educational Background**: Master's degree (or equivalent) in [Food Technology, Food Engineering, Materials Science, Biotechnology, Pharmaceutical chemistry, Chemical Engineering or related areas].
- Skills: Strong laboratory and analytical skills in [food chemistry, food structure, food technology, sensory analysis, materials science].
- **Languages**: Proficiency in English (written and spoken) is required.
- Strong motivation to pursue doctoral research in an international and interdisciplinary environment.
- Ability to work independently while contributing effectively to collaborative research activities.
- Good organization, communication and problem-solving skills.
- Willingness to travel for planned secondments, network meetings and training activities.
- Commitment to responsible research conduct, inclusion, collegiality and professional development.

## MSCA Doctoral Network Eligibility Criteria

Applicants of any nationality are welcome to apply. At the date of recruitment, applicants must meet the following MSCA Doctoral Network requirements:
- **Doctoral candidate status:** Applicants must not already hold a doctoral degree. Applicants who have successfully defended their doctoral thesis but have not yet been formally awarded the doctoral degree are not eligible.
- **Mobility rule:** Applicants must not have resided or carried out their main activity (work, studies, etc.) in Italy for more than 12 months in the 36 months immediately before the recruitment date. Compulsory national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status under the Geneva Convention or EU temporary protection are not taken into account. **Compliance is verified before the start of employment, on the basis of the candidate's passport and, where necessary, other documents.**

- **PhD enrolment:** Doctoral Candidates must be enrolled in a doctoral programme leading to the award of a doctoral degree in at least one EU Member State or Horizon Europe Associated Country. For this position, this is the doctoral programme at the University of Udine; applicants must therefore meet its admission requirements.

→ **Visa and residence permit:** a visa or residence/work permit is not required at the application stage and is not a selection criterion. Where needed, it will be arranged after selection and before the start of employment, with the support of the recruiting organisation. Candidates from non-EU countries are equally welcome to apply.

## What FAroGels Offers

- A full-time doctoral position funded through the **FAroGels** MSCA Doctoral Network.
- A fixed-term employment contract for 36 months at the University of Udine.
- A competitive salary and employment conditions in accordance with the MSCA Doctoral Networks funding provisions, applicable national legislation and the policies of the Recruiting / Host Institution.
- Social-security coverage and other employment-related benefits in accordance with the applicable national and institutional framework.
- A Personal Career Development Plan (PCDP), prepared with the supervisory team and reviewed and updated during the project.
- Access to research facilities, infrastructure, training and support services at the Host Institution and within the FAroGels network.
- Participation in a structured doctoral training programme including scientific and technical training, transferable skills, career development and innovation-oriented activities.
- Planned secondments at FAroGels partner organizations, offering complementary scientific, technical and cross-sectoral experience.
- An international research environment and opportunities to build a professional network across academia and non-academic organizations.

## Salary and Financial Package

This position is funded by the FAroGels MSCA Doctoral Network (HORIZON-MSCA-2025-DN-01-01, Grant Agreement No. 101312450). The salary is based on the following monthly MSCA allowances:

- **Living allowance:** EUR 4,010, adjusted **by the country correction coefficient** of the country of the recruiting organisation to ensure equal treatment and comparable purchasing power for all researchers.
- **Mobility allowance:** EUR 710, contributing to mobility-related costs such as relocation and travel.
- **Family allowance (if applicable):** EUR 660, paid for the months in which the Doctoral Candidate has a family during the project, including where family obligations arise after recruitment. 'Family' means persons linked to the researcher by marriage (or a relationship with equivalent status recognised by the legislation of the country where it was formalised) or dependent children actually being maintained by the researcher. The allowance is paid in accordance with the rules of the recruiting organisation, and supporting documents may be requested.

**Monthly MSCA allowances for this position**

| Component | Calculation (per month) |
|---|---|
| **Living allowance** | EUR 4,010 × [country correction coefficient = 95.3%] (see guidance below) |
| **Mobility allowance** | Fixed amount = EUR 710.00 |
| **Total without family allowance** | Living + mobility allowance |
| **Total with family allowance** | Living + mobility + EUR 660 |

***Please note:*** *the amounts above represent the total employment cost, from which the employer's and the employee's compulsory social-security contributions and taxes are deducted in accordance with national law. Unless the recruiting organisation provides additional funding, the gross salary paid to the Doctoral Candidate is therefore lower than these amounts, and the net salary depends on personal circumstances.*

**Country correction coefficients of the FAroGels beneficiaries**

| Country | CCC | Living allowance | + mobility (EUR 710) | + family (EUR 660) |
|---|---|---|---|---|
| Türkiye | 64.5% | 2,586.45 | 3,296.45 | 3,956.45 |
| Poland | 74.1% | 2,971.41 | 3,681.41 | 4,341.41 |
| Italy | 95.3% | 3,821.53 | 4,531.53 | 5,191.53 |
| Spain | 95.6% | 3,833.56 | 4,543.56 | 5,203.56 |
| Germany | 101.2% | 4,058.12 | 4,768.12 | 5,428.12 |

| Country | CCC | Living allowance | + mobility (EUR 710) | + family (EUR 660) |
|---|---|---|---|---|
| Finland | 118.0% | 4,731.80 | 5,441.80 | 6,101.80 |
| United Kingdom | 141.7% | 5,682.17 | 6,392.17 | 7,052.17 |

**Employment conditions:** the Doctoral Candidate will be hired full-time (100%) by the recruiting organisation on a 36-month employment contract, with social-security coverage under national law that continues during secondments.

## Funding Duration and PhD Completion

- This Doctoral Candidate position is funded by the FAroGels MSCA Doctoral Network for a maximum period of 36 months.
- The overall period required to complete a PhD degree may, depending on the regulations of the PhD awarding institution and applicable national requirements, extend beyond the 36-month FAroGels funding period.

***Please note:*** *any employment, scholarship or other financial support beyond the 36-month FAroGels funding period is not covered or guaranteed by FAroGels. Any potential continuation of employment or funding would need to be considered separately between the relevant institution and the Doctoral Candidate, subject to institutional regulations and the availability of funds.*

## About the Host and PhD Awarding Institution(s)/Organizations

The University of Udine is organized in 8 departments and actively involved in student and staff exchange projects with universities within the European Union, Australia and Canada, and is currently engaged in close collaboration with several universities from Eastern Europe and other non-EU countries. UNIUD participates in many research projects at the national and international level. UNIUD has been involved as a partner in more than 400 projects and has indeed acquired research funding on several competitive calls (e.g., Horizon 2020, Horizon Europe, NIH, ONR, COST, ERA, PRIMA). The University currently has approximately 17,000 enrolled students. Within the Department of Agriculture, Food, Environmental and Animal Sciences, all the facilities needed to support the PhD student in the project are available. These include: a semi-automatized lab-scale CO2 plant for the preparation of aerogels; a lab scale ball-mill for particle dimension down-sizing; equipment for aerogel analysis (e.g., internal surface area analyzer, tapped density analyzer); equipment for food-packaging prototyping (e.g., a thermo-press, modified-atmosphere (MAP) and vacuum-packaging machines); equipment for the physical and chemical analysis of food-packaging systems (e.g., a dynamometer, headspace atmosphere analysers, a tensiometer, equipment for analysis of migration, biodegradability and barrier properties); a professional kitchen for the preparation of food prototypes; a laboratory for physical analysis of food structure (e.g., DLS, rheometer, texture analyser, SEM, optical and confocal microscopes, calorimeter); a laboratory for chemical analysis of food (e.g., HPLC, GC, GC-MS, FTIR, NMR, spectrophotometer, fluorimeter); LABAS laboratory for sensory evaluation of foods according to ISO standards (https://www.uniud.it/it/territorio-e-societa/uniud-lab-village/laboratorio-labas); Village Labs (LARA https://www.uniud.it/it/territorio-e-societa/uniud-lab-village/laboratorio-lara) for technology transfer to industries and preparation of foods for sensory analysis.
The successful candidate must fulfil the admission and enrolment requirements of University of Udine.

| Item | Information |
|---|---|
| **Doctoral programme / doctoral school** | Food Science |
| **Relevant faculty / department** | Department of Agricultural, Food, Environmental and Animal Sciences |
| **PhD admission and enrolment requirements** | Master degree |
| **Separate PhD application or enrolment procedure** | No |

| Item | Information |
|---|---|
| **Recognition of foreign qualifications** | Applicable to selected candidates for enrollment.<br><br>Candidates who hold a degree obtained abroad must submit at the time of enrolment the following documents:<br>Degrees issued by a signatory country to the Lisbon Recognition Convention (https://www.enic-naric.net/) these documents:<br>- Diploma Supplement in English issued by the relevant University;<br>- "ARDI Certificate of Correspondence and Foreign Degree Verification Certificate" issued by CIMEA (Information Centre on Academic Mobility and Equivalence). The Foreign Degree Verification Certificate is issued through the "diplome" platform at https://cimeadiplome.it/<br><br>Degrees issued by a country which is not a signatory to the Lisbon Recognition Convention one of the following documents:<br>- "Declaration of value" (DOV) issued by the Italian diplomatic authority in the country where the qualification was obtained, as well as a certificate containing transcripts of examination results and grades pertaining to the degree. If this certificate is in a language other than Italian or English it must be accompanied by an official translation into either English or Italian (certified by the competent diplomatic-consular authority or sworn at a court in Italy);<br>- "Certificate of Comparability and Foreign Degree Verification Certificate" issued by CIMEA (Information Centre on Academic Mobility and Equivalence) through the "diplome" platform at https://cimea-diplome.it/https://cimea-diplome.it/<br>If the above-mentioned documents are not available at the time of the enrolment procedure, the applicant must provide proof that she/he has made a request by that date and submit it within the first year of enrolment. |
| **Additional requirements** | - Proficiency in the English language is required, as well as good communication skills, both oral and written. Successful candidates will need to provide an English test (e.g. IELTS, TOEFL, Cambridge English). You may be exempt if you are a national of a majority native-English speaking country, or have qualifications / degree that has been taught and assessed in English.<br><br>**For enrollment:**<br>- Non-EU citizens must comply with the regulations on entry visas and residence permits.<br>- A copy of the permit of stay or the receipt of the permit application (if the permit has not yet been issued) must be sent to University offices.<br>- UNIUD annual fees and contributions for PhD students are Euro 276,00.<br>- Any additional enrolment documents (including documents relating to foreign qualifications or immigration status, where applicable) will be requested according to the candidate's circumstances and the final UniUD instructions. |

## Application Documents

Applicants are strongly advised to read the position description and the eligibility criteria carefully before applying. Each application must include:

- A detailed curriculum vitae (education, research experience, technical skills and relevant achievements), including the dates and countries of residence, studies and employment for the last 36 months.
- A motivation letter explaining your interest in this position and your suitability for the project.
- Copies of Bachelor's and Master's diplomas and academic transcripts, or evidence that the Master's degree will be completed before the recruitment date.
- Contact details of two referees and reference letters, according to the requirements of University of Udine.
- Proof of English-language proficiency, if required by the PhD awarding institution.
- Incomplete applications may not be considered.

## How to Apply

**Application route: FAroGels online application form**: please complete the application form at https://farogels.eu/apply/.

## Indicative timeline

- **Application deadline:** 09 December 2026, 23:59 (CET)
- **Interviews:** January 2027
- **Evaluation:** February 2027
- **Selection outcome:** February 2027
- **Expected start of employment:** March 2027 (earliest)

***Please note:*** *Applicants should ensure that all required documents are submitted before the stated deadline. Selected candidates will be contacted directly by the University of Udine PhD offices for detailed information on enrollment procedures.*

## Selection Process

FAroGels follows an open, transparent and merit-based recruitment process in line with the European Charter for Researchers:

- **Eligibility check** by the FAroGels Project Manager.
- **Evaluation** of the eligible applications by an Interview Committee (primary supervisor, co-supervisor(s) and a representative of a non-academic partner) with a standardised scoring matrix; the three to five best-ranked candidates are shortlisted.
- **Online interview** with the shortlisted candidates.
- **Approval** of the selection by the FAroGels Supervisory Board, after which an offer is made.

All applicants are informed of the outcome and receive feedback on request.

## Equal Opportunities and Data Protection

FAroGels and University of Udine are committed to equal opportunities, diversity and inclusion. Applications from all qualified candidates are welcome, irrespective of gender, gender identity or expression, sexual orientation, ethnic or social origin, nationality, disability, age, religion or belief.

Personal data submitted with applications will be processed by the University of Udine exclusively for recruitment purposes and in accordance with the applicable data-protection legislation and institutional privacy policies.

## Contact Information

- **Scientific questions about the project:**

Lara Manzocco, Full Professor
Department of Agricultural, Food, Environmental and Animal Sciences
University of Udine

- **Application process and PhD admission:**

University of Udine
Website: https://www.uniud.it/en/research/do-research/doctorate-res/phd-admission/admision-procedure

- **General questions about FAroGels and the recruitment process:** FAroGels Project Management Team, Middle East Technical University (METU), Ankara, Türkiye – farogels@metu.edu.tr
- **General information on FAroGels:** https://farogels.eu/

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