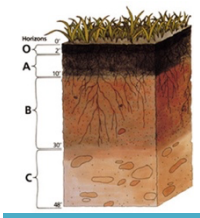
Four years PhD position in Poland (Gliwice, Polytechnika Śląska)




$$C_{tot} = C_{old} + C$$
$$C_{tot} \cdot \delta^{13}C_{tot} = C_o$$
$$C_{tot} \cdot F^{14}C_{tot} = C_o$$

Evaluation of benefits of inter-row crops on vineyard soil carbon dynamics in different pedological and climatic contexts based on ^{14}C, ^{13}C, ^{15}N geochemistry

This position is funded by the Silesian University of Technology and the EJP Soil SANCHOSTHIRST project

Project

topics: The thesis project is part of the larger SANCHOSTHIRST project funded by the European Community (H2020) through the EJP SOIL program[1]. The start of SANCHOSTHIRST[2] is planned for May or June 2023, for 3 years. The thesis will continue beyond the duration of the project, up to 4 years. The project coordination is led by Prof. Maria José Marques, Universidade Autónoma de Madrid, Spain, while Silesian University of Technology is the Polish partner (PI: Dr. hab. Ch. Hatté).

Traditional tillage in woody crops is a paradigmatic example of the effect of unsustainable management on soil degradation due to erosion and the loss of organic carbon (SOC), nutrients, and biodiversity. The use of cover crops increases the SOC and produces a cascade of benefits in soil structure, water storage, or biodiversity. However, farmers are sometimes reluctant to use cover crops. To involve them, research must clearly highlight the current state of degradation of soils in woody crops and the feasibility, with pros and cons, of cover crops as a sustainable management practice. To this end, the project will use two case studies: vineyards and olive groves, both in a semi-arid context. The results of these extreme cases can then be used as an example to follow or even adapted for other crops and/or other regions.
By combining a series of isotopes (^{13}C, ^{15}N, ^{14}C), we will follow the dynamics of additional carbon inputs by inter-row crops and the interaction with the carbon initially in the soil. These measurements and the resulting conceptual and statistical analysis will allow to identify the agronomical practices (inter-row plants and agricultural practices) to be adopted according to the climatic and pedological environment to obtain the best return on the carbon storage in the soil.
The student will be involved in the sampling in Spain and Italy, in the conditioning and preparation of the samples, in the isotopic analyses (^{13}C, ^{15}N, ^{14}C), in the statistic and conceptual analysis of the results. The study should result in 2-4 papers for the student to take the lead. The student will be asked to present these results at the SANCHOSTHIRST consortium and at international conferences. The student will also contribute to the preparation and realization of the disclosure of the results to the general public and stakeholders.

laboratories: Division of Geochronology and Environmental Isotopes, Institute of Physics, Silesian University of Technology, Gliwice, Poland

supervision: Thesis supervision is done by Dr. hab. Christine HATTÉ, Prof. PŚ[3]. The young researcher will also benefit from the expertise of a larger supervising team, inc. Dr. hab. Natalia Piotrowska, Dr. Alicja Ustrzycka, Dr. hab. Sławomira. Pawelczyk, Mrs. Agnieszka Wiszniowska of the Division of Geochronology and Environmental Isotopes[4]. Interactions with SANSCHOTHIRST consortium will be frequent.

Applications (students both from European and non-European countries are welcome to apply)

skills: The young researcher will hold a Master 2 in earth and environmental sciences or related domains and shows a real interest for soil sciences. All interactions will be in English, thus good knowledge of the English language is mandatory.

salary: The salary consists of a classic university scholarship[5] plus a bonus given by the European project.

application deadline: the application process will start on May 22nd 2023 (first round) and July 27th 2023 (2nd round). Expected beginning of the PhD: October 2023.

how to apply: send resume, cover letter and copies of degrees and grade reports issued by universities attended after secondary school to christine.hatte @ polsl.pl . This will be the first start in the process: we review your application and provide you with the support letter that will allow you to formally apply on the SUT website. We will only grant a letter of support to one applicant. The next step will be a competition, at the SUT level, with other PhD candidates in different fields. Selection will be based on an interview inc. an oral presentation and requested documents. See the link below[6] to learn more about the requirements, required documents and selection criteria.

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[1] https://ejpsoil.eu/
[2] Website under construction. SANCHOSTHIRST: Cover cropS (CC) ANd soil health and climAte CHaNge adaptatiOn in Semiarid woody crops. THe RemOte SensIng and furTHer scenaRIoS projecTions
[3] https://www.researchgate.net/profile/Hatte-Christine
[4] https://fizyka.polsl.pl/index.php/en/about-institute/divisions/division-of-geochronology-and-environmental-isotopes
[5] currently: 2,372 PLN (2,104 PLN net) per month for the 1st and 2nd year of doctoral studies, 3,653 PLN (3,242 PLN net) for 3rd and 4th year.
[6] https://rekrutacja.polsl.pl/jdsmain/