

NEWSLETTER NR. 1

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ABOUT COST ACTION SAGA (CA17131)

The Soil Science and Archaeo-Geophysics Alliance is an interdisciplinary network of scientists that aims to develop, promote and facilitate scientific activities that integrates archaeo-geophysics and soil science with the overall goal of maximising interpretation of proxy data for archaeological investigations. SAGA's network and related activities are funded by the European Cooperation in Science and Technology (COST).

Visit our website: <u>https://www.saga-cost.eu/</u>





COST is supported by the EC Horizon 2020 Framework

EDITOR'S ADDRESS



Dr Agnese Kukela Researcher, University of Latvia) COST Action SAGA Science & Communications Manager

Dear reader

I am very pleased to introduce you the very first issue of SAGA newsletter. In this issue we focus on the highlights of the Working Groups (WGs) progress and give you a brief insight about the research topics developed during the implemented Short Term Scientific Missions (STSM) and research ideas introduced on the International Conferences via Inclusiveness Target Countries (ITC) Conference grants. We would also like you meet one of the key persons behind the Action - our Chair Dr Carmen Cuenca-Garcia from the Norwegian University of Science and Technology (NTNU), who will tell about her research interests and reveal how the idea to make a COST Action proposal was born. We hope that you will enjoy reading this newsletter and it will inspire and, perhaps, even encourage you to join us!

Enjoy the reading!

EDITORIAL BOARD & COLLABORATORS

Agnese Kukela, Carmen Cuenca-Garcia, Kayt Armstrong, Luke Beesley, Emanuele Colica, Sebastiano D'Amico, Philippe De Smedt, Kemal Edip, Ekhine Garcia-Garcia, Milan Gazdic, Mandana Parsi, Michal Pisz, Mezgeen Rasol, Anne Roseveare, Simo Spassov, Mercedes Solla, Baris Tecimen & Clare Wilson.

PAST EVENTS -by Dr Agnese Kukela & Local Organisers

Meeting 1: SAGA's kick-off Meeting (Brussels, Belgium)

The very first SAGA's Management Committee (MC) meeting was organised in Brussels on October 26, 2018. Members from 28 different countries were present to launch SAGA officially and nominate the key persons responsible for the implementation and promotion of SAGA.

Meeting 2: 1st Joint WG & 2nd MC Meeting, (Rethymno Crete, Greece)

The first joint WG and second Management Committee (MC) meeting took place in Rethymno, a picturesque city of Crete Island on March 2-4, 2019. During the brainstorming session, MC members had an opportunity to present their work, proposals and ideas related to SAGA goals. Parallel WG sessions were focused on the development of an Action Plan. During the following Plenary session the WG leaders summarised the outcomes of the different WGs discussions from previous sessions. They presented their respective WG Action Plan to all the MC members. The second part of the last day of this meeting was devoted to the 'Second MC Meeting' of COST Action SAGA to review the outcomes of Grant Period 1 and plan ahead for next Grant Period.

Training School 1: Introduction to the Use of Geophysical & Soil Science Methods in Archaeology (Burguete/Auritz, Navarra, Spain) -by Dr Ekhine Garcia-Garcia

The first SAGA Training School (TS) was organized in Auritz (Navarra) on July 29 – August 2, 2019 and was held at the archaeological site of Zaldua, Spain. Being the first TS, it was designed to be on an introductory level. The main objectives were to explain fundamental concepts and provide a clear methodological understanding of routine geophysical and soil science methods used in archaeological investigation. The TS was addressed to Master students, PhD candidates, postdoctoral researchers, field archaeologists, curators and other professionals working in cultural heritage management with none or little knowledge of those techniques. In order to provide practical experience, theoretical sessions were complemented with hands-on sessions at the archaeological site of Zaldua. The TS received 52 applications mainly from PhD students, but also from master students, researchers and professionals. Out of these 21 trainees from 12 affiliation countries were selected and joined the TS together with 11 trainers from 6 different countries.

Eventually, Zaldua proved to be a perfect site to host the TS given the previous archaeological, geophysical and soil research that had already been undertaken. This provided a broad context to illustrate the application and complementarity of different disciplines and methods, as well as to interpret the new data collected. In addition, some areas in Zaldua pose difficulties in terms of their archaeo-geophysical interpretation. These were used to challenge the trainees in archaeo-geophysical interpretation as well as discuss and show - case solutions.



Members during SAGA Meeting 1in October 2019



SAGA members during Meeting 2



SAGA Training School 1 participants learning about electrical resistivity tomography (ERT).



Trainees learning about how to carry out different soil analyses to investigate archaeological deposits.



Video summarising SAGA's Training School 1 Click on the image to see the video.

<u>Meeting 3: Workshop 1, 2nd Joint WG Meeting & 3rd MC Meeting (Prague,</u> <u>Czech Republic)</u>

This third meeting was held in Prague in September 30 - October 1, 2019 at the Institute of Geophysics of the Czech Academy of Sciences. Meeting 3 combined three meetings: Workshop 1, Joint WG Meeting 2 and MC Meeting 3. Workshop 1 aimed to establish disciplinary challenges and the inter-disciplinary common ground around archaeological geophysics and soil science in order to identify research gaps and develop an agenda to shape future collaborative work. In doing so, the workshop's participants discussed and synthesised the findings of past and current projects and studies exploring, inter alia, how land use practices, high variability in soil properties, soil post-depositional and other taphonomic processes within archaeological features may have an effect on archaeo-geophysical prospection. Throughout the workshop, participants showcased integrated studies, combining geophysics and soil science, aiming to maximise the interpretation of archaeological sites. The topics of the Workshop 1 were focused on: Developing a common ground (overview/synthesis papers); Integrated approaches combining geophysics and soil science at archaeological sites; Challenging survey environments and/or data; Experimental/Monitoring projects (conducted at archaeological sites or related to archaeo-geophysics); Multivariate proxy data analysis and/or forward modelling; and Demonstrations (hands-on session). The book of abstracts is available here: https://www.saga-cost.eu/meeting-abstracts.php?id_ meeting=3 and a full report on this meeting is available at: https://www. researchgate.net/publication/340526674_Workshop_1_WORKSHOP_RE-PORT.'



One of the presentations during SAGA Workshop 1.



Local Organiser on active seismic during SAGA Meeting 3.

The second joint WG and the third MC meeting was also organised in Prague, after Workshop 1 was finished. Like always, WG members were able to discuss the implementation of the Action Plan approved during the last meeting in Rethymno and stress the most important tasks to focus on during the Grant Period 2. During the MC meeting the update on SAGA progress was given by the Chair and Core Group members. Representatives from 33 member countries were present in this meeting, including 5 newcomers from Austria, Denmark, North Macedonia and Slovenia. SAGA network is continuing to grow and we expect members from yet not represented countries to join us!



SAGA members during Meeting 3.

Training School 2: Digital Soil Geochemistry Mineralogy, Isotope & Moisture Characterisation (Aberdeen, Scotland, UK) – by Dr Luke Beesley

What a difference a month makes; it is less than 30 days ago, as I write this, that trainees from COST Action SAGA came together at The James Hutton Institute in Aberdeen, for the Soil Geochemistry training school. Now, at the start of April when I would usually be out in the field mapping soils, I am working from home on some papers, baking cakes and even thinking of painting my garden shed. Good time to reflect then on the last SAGA event before the spread of Coronavirus overtook us, and also look forward to future events after the current lockdowns are lifted.

Our institute here in Aberdeen has a long history of soil science, dating back to the 1930s, and we have accumulated long experience of surveying, mapping and analysing soils. As we hold the National Soils Archive of Scotland, which has tens of thousands of soil samples in its collection, and we have expert soils knowledge on hand, I thought it would be a suitable venue to offer a training school on soil geochemistry. With the help of my colleagues Ben Butler and Barry Thornton, Vincent Van Walt and Jess Irvine of Van Walt Ltd, we put together a program including classroom sessions, practical work using data from the soils archive, as well as field activity with the latest soil moisture measuring instruments. In the evenings we continued to share experience and expertise on soils in several of the best local pubs, where we sampled some local food and drinks. Day 1 focused on the inter-relationships between trace elements and nutrients in soils, and important determinants in their mobility in soils; namely how they become more or less soluble. After a morning classroom session from myself, Ben Butler gave a practical session in the afternoon working with mineralogy data, to explain how certain elements analysed in soil solutions (pore waters, leachates etc) could be explained by their mineralogy. In the evening we met for a dinner of typical Scottish foods, namely haggis, neeps and tatties. Day 2 was all about soil moisture, how to measure it and the latest equipment for doing so. Vincent Van Walt gave a highly interesting session on the use of time-domain reflectometry (TDR) methods, answering many questions of trainees about the application of these methods in their own work. In the afternoon we went outside to test the equipment in various locations, from hand-held devices to soil profile data loggers. We were lucky that the weather was great, sunny and warm [by Aberdeen standards], so we could spend the whole afternoon outdoors working with the instruments. In the evening we took refreshment at one of the various pubs in the city centre, and continued the chatter. Day 3 was specifically on isotopes, and we had two great sessions from Kate Britton (Uni of Aberdeen) and Barry Thornton on the analysis of stable isotopes in environmental samples, for determining when and where materials have come from. Kate presented some great new work that her group has done in archaeological sites in Aberdeen. Barry showed us how carbon accumulation and loss in soils can be measured by isotopes, shedding new light on the land use changes that could help us to sequester more carbon in soils. Thereafter trainees and trainers said their goodbyes and we dispersed until the next COST SAGA event.

I can certainly say that the workshop was very enjoyable, and I learned a lot from trainers and trainees alike. I extend thanks to all of those trainees who attended, my colleagues from our institute and those from Van Walt Ltd who were so willing to help and gave their time to get involved in the training school as trainers. Looking forward to the next one.



Trainees at work understanding soil mineralogy data during the computer lab session with Ben Butler.



Classroom session with Vincent Van Walt demonstrating how TDR moisture measurement works.



Inside the National Soils Archive of Scotland.



In the field learning how to install, operate and collect data from a variety of instruments.



SAGA trainees and trainers gathered outside The James Hutton Institute.

MEET OUR MEMBERS -November 2019



Dr Carmen Cuenca-García SAGA's Chair (www.cuencagarcia.com)

Carmen is a postdoctoral researcher at the Norwegian University of Science and Technology-NTNU (IAK, NTNU VM) since Jan 2017. She holds a BA in Archaeology and Prehistory (University of Valencia), a MSc in Archaeological Prospection - Shallow Geophysics (University of Bradford) and a PhD in Archaeological Geophysics (University of Glasgow). She has held positions at GeoSat ReSeArch (IMS-FORTH) in Rethymno, Crete (2013-2015) and the CTBTO, in Vienna (2015-2016).

What are your research interests? What are you working on?

My research focuses on archaeological geophysics, or in other words, the use of geophysical techniques to discover, map and characterise archaeological sites and landscapes in a non-destructive and minimally invasive way. In particular, I have been working on integrating soil/deposits charaterisation as part of archaeo-geophysical investigations to provide more detailed interpretations. I have been doing this using test-sites in Scotland during my PhD and while exploring sites in Greece and Cyprus as part of my postdoc work at GeoSat ReSeArch. Besides archaeological investigations of geophysical prospection. These include the use of high-resolution geophysics to detect illegal infrastructure (something I did during my time in Vienna with the CTBTO) but also to find unmarked human burials and mass-graves.

In my current position at NTNU, I am exploring the use of archaeo-geophysical surveying in frozen soil and snow conditions for various purposes. These include assessing the quality of the results in order to extend the typical 'geophysical' fieldwork season. I have been developing other projects related to the recording and monitoring of endangered archaeological sites using an interdisciplinary approach - of course, including geophysics. From time to time, I do a wee bit of teaching on archaeo-geophysics and go to the field to survey some of the beautiful sites we have here in Trøndelag, something I particularly enjoy. After an intense first year of SAGA, and now with the Action running smoothly, I do hope to be back in the field more often.

How did you come to the idea to make a COST Action proposal?

To answer to this I need to go back to 2013, when I was working at Geo-Sat ReSeArch, in Rethymno. The following year, Kayt Armstrong and Ian Moffat, two other 'soil-interested' archaeo-geophysicists were also hired by the Iab. Soon we engaged in conversations about our experiences in integrating soil analysis as part of archaeo-geophysical surveys, its poten-



Enjoying the view at the top of Buachaille Etive Beag in 2011, one of the munros that Carmen climbed when escaping from PhD duties.



Carmen and Apostolos Sarris collecting GPR data at Magoula Rizomilos in Thessaly (Greece) in 2014.



Arne A. Stamnes' drone filming of Carmen collecting GPR data at Austrått Manor in Ørlandet (Trøndelag, Norway) in 2018.

tial, or the challenges we faced. After some of these stimulating chats, we decided that it would be really good to organise an event to share experiences and discuss perspectives with other peers with similar interests. So, after a highly caffeinated preparation meeting at our ubiquitous Arokaria Cafe, we presented a workshop proposal to our director at the time, Apostolos Sarris, who fully supported it. And this is how the 1st Interactions between Soil Science and Geophysics in Archaeological Prospection (ISSGAP)' Workshop came together. Given the constrained time and resources (we all had tight fieldwork schedules and were due to finish our contracts by Jul/Sep 2015), we only managed to organise a small gathering. Thanks to the support of our lab and the enthusiasm and generosity of the external participants, who had to cover their own travel and accommodation expenses, we all met in Rethymno between 17-18 Jun 2015. Apart from the organisers, other lab participants included: Abir Jrad and Kelsey Lowe, who had joined the lab for some months. The external attendants were: Elina Aidona, Philippe De Smedt, Martijn van Leusen, Anne and Martin Roseveare, and Clare Wilson. These are all members or collaborators of SAGA now. I have to say that it was massively stimulating to sit together to discuss approaches, identify common issues, and foresee future work. Also, on the last day of the workshop, we decided to go for a COST Action to formally establish ourselves and grow up as a network to pursue the initial research agenda we devised during that meeting.

The actual preparation of the proposal had to wait until 2017 to materialise, as Kayt, Ian and I had to relocate to new positions. We all met again between 5-7 Jun 2017 in Rethymno to draft the proposal. It took us a few months to fully develop it but we managed to submit by the deadline in Sep 2017, with the support of an initial network of 32 proposers from 25 COST member states. The time and efforts paid off and SAGA was selected on first submission in a call with an extremely low success rate, which is something to be proud of.

As you can see, the idea of putting together a COST Action proposal was a direct consequence of the first ISSGAP Workshop, and the idea behind SAGA, the result of colleagues sitting together and sharing experiences and visions. Something that we can keep doing now without worrying about finances (/money).

What would like COST Action SAGA to achieve?

It would be great to see SAGA ending up as consolidated and tuned-in network of colleagues seeding and sprouting collaborative research projects to study and safeguard our cultural heritage. If on the journey we stimulate any students, cultural heritage professionals or others on the use of our methods and strategies, I would consider myself very satisfied!



Participants of the ISSGAP Workshop 1 in Rethymno (Crete, Greece) in 2014.



SUPPORTED STSM -by the grantees, Dr Kayt Armstrong & Dr Agnese Kukela

For the moment 5 Short Term Scientific Missions (STSM) were completed and one is underway in the beginning of the year 2020. The key information on each reported STSM is given below.

Michal Pisz (PhD student, University of Warsaw)

Understanding the Anomaly – MultiMethod Geoscientific Research of the Roman Fort in Pojejena, Romania. This STSM took place 23/02/19 to 16/03/19 and was hosted by the National Museum of Banat -Timişoara, Romania. The mission was a success, and multiple methods were employed and compared at the site in question, which has led to new insights about the site, but also importantly provided a large suite of measurements using different methods at the same site, including soil sampling. This will be fully explored in Michal's PhD research. The mission has also fostered co-operation between Polish and Romanian researchers which promises to yield further joint projects and skill sharing. Michal presented his results at ICAP 2019 in Sligo, Ireland.



Michal and his team of volunteers on site (photo by Michal, from a UAV used for topographic modelling).

Mandana Parsi (PhD student, Ludwig-Maximilians-University of Munich)

Adapting and optimizing electrical resistivity tomography (ERT) for archaeological purposes This STSM took place from 11/03/19 to 24/03/19, and was hosted by the GeoSatReSeArch Laboratory, part of the Institute for Medieterranean Studies, FORTH, on Crete. This mission was to train Mandana in the use of specific electrical modelling methods to process and interpret data gathered at her fieldwork sites in Germany, Georgia and Iraq, and forms an important part of her PhD research. Mandana and her host, Dr Nikos Papadopoulos were able to make 3D inversions of data from Iraq that successfully detected mud-brick structures. Their results were presented at ICAP 2019 in Sligo, Ireland, and it is hoped Dr Papadopoulos will make a return exchange to Munich to collaborate further with the research group there.



Processed data from Iraq, by Mandana Parsi. Resistivity distribution (the left picture) and magnetic map (the right picture). The blue lines show the outer walls of the house, which we can see in both maps and green lines are continuations of the walls of the house. The resistivity values show that the house is made of mudbricks and it matches to the archaeological evidence.

Dr Sebastiano D'Amico (Senior lecturer, University of Malta)

Combining geomorphological and geophysical investigations at the Scifi Archaeological site. This mission ran from 13/04/19 to 19/04/19 and was hosted by University of Messina (Dipartimento di Scienze Matematiche e Informatiche, Scienze Fisiche e Scienze della Terra - MIFT) in Sicily, Italy. The purpose of the mission was to undertake novel methods for evaluating cultural heritage sites (from a conservation perspective as well as a prospection perspective). This involved making passive seismic (vibration) measurements and collecting ground penetrating radar (GPR) data alongside geoarchaeological measurements at the site of Scifi. The mission also aimed to serve a proof-of-concept to act as an example for future coordination among conservators, researchers, and developers who share the goals of revealing, researching, preserving, and presenting cultural heritage. The mission resulted in the detection of further archaeological structures on the site, and the vibration studies showed the matrix covering the site has no strong layering, raising the possibility the sediments relate to landslides. The collaboration went well and the hosts are keen to participate further in the action. This work was presented at the recent SAGA workshop in

Milan Gazdic (PhD student, University of Belgrade)

Twelve centuries long iron smelting pollution record - A unique a chive of mining and industrial history at Moravian Karst This STSM was conduced from 01/07/19 to 07/09/19 and was hosted by the Institute of Geophysics, Czech Academy of Sciences in Prague. The aim of the STSM was to collect and process samples from a metal production area in Moravia, in order to understand the human impact on the soils and the nature of the pollution record that could be understood from geophysical measurements on soils and soil samples. In the studied area, increased values of topsoil magnetic susceptibility are linked to soil pollution. Milan concluded that magnetic susceptibility mapping can be used as an effective proxy approach, which reflects iron smelting activities performed during different time periods.



Illustration by Sebastiano showing part of the 3D model of the site created during the mission, the seismic sampling points and data obtained.



Field measurement of insitu MS in Moravia (picture by Milan).

ITC CONFERENCE GRANTS

-by the grantees, Dr Simo Spassov & Dr Agnese Kukela

Inclusiveness Target Countries (ITC) Conference Grants are aimed at supporting early career investigators (ECI) and PhD students from participating ITC to attend international science conferences. So far, three early Phd candidates have presented outcomes of their recetn research carried out within the frame of SAGA.

Emanuele Colica (PhD student at the University of Malta) presented geophysical measurements from the Acropolis Archaeological Area of Gela (Italy) at the EGU in Vienna in 2019. His poster describes how a multidisciplinary approach enhances the information content and eases the overall interpretation of data. Concretely, he demonstrated this by overlying ground penetrating radar (GPR) slices onto the archaeological map of the site. Certain GPR anomalies not interpretable with GPR alone, could be well-associated in the overlay with archaeological artefacts. The combination of various multidisciplinary approaches in order to establish harmonised field solutions for data collection is one of the objectives of WG 2.

The work of Melda Küçükdemirci (ECI from the Istanbul University, Turkey) deals with processing multidisciplinary images. In her talk, given at 13th International Conference of Archaeological Prospection in Sligo (Ireland) in 2019, she explained an approach for discriminating GPR anomalies through automated segmentation of overlay images estab ished from GPR and archaeological maps by using a convolutional neural networks (CNNs). The work of Melda contributes to the WG3 objective related to the identification and evaluation of innovative solutions for multivariate proxy data.

The Understanding The Anomaly (UTA) project of work of Michał Pisz (PhD student, University of Warsaw, Poland) deals with multidisciplinary approaches for archaeometric field data acquisition. Michał presented a talk and a poster at the 13th International Conference of Archaeological Prospection in Sligo (Ireland) in 2019, concerning testing and assessment of responses of various complementary geophysical methods. In two field studies, he has shown that the use of several different geophysical prospecting methods may facilitate the interpretation of complex archaeological sites, but emphasizes the need for further investigation of geophysical anomalies and their correlation with results from soil and material analyses. Michał was awarded the price of the best poster presentation by International Society for Archaeological Prospection for his poster entitled "The good, the bad and the ugly data". Michal's work contributes to the WG 2 objective: Explore, discuss and evaluate integrated approaches using geophysical, archaeological and soil sampling methods with the goal of identifying gold standard field solutions for data collection. The three ITC Conference Grant grantees not only presented their latest research results at international conferences, but also established network connections with other scientists for further collaboration and for their carrier planning.



Emanuele Colica (left) from Malta in front of his poster at the the EGU in Vienna 2019, together with Raffaele Persico (right).



Melda Küçükdemirci from Turkey giving her oral presentation at the 13th International Conference of Archaeological Prospection in Sligo (Ireland).



Poster awardee Michał Pisz.



Networking during the 13th International Conference of Archaeological Prospection in Sligo (Ireland). Armin Schmidt (left), Michał Pisz and Michel Dabas (right). Photo: M. Scheiblecker.

HIGHLIGHTS OF THE WORKING GROUPS PROGRESS -November 2019

Knowledge Creation, Exchange & Development -by Dr Clare Wilson The membership of the participants of this WG covers a diverse range of skills and expertise and the group has grown over the last few months

with a number of new recruits. WG1 main objectives are to structure the knowledge of fundamental soil parameters involved in the detection of archaeological features using geophysical techniques with the goal of maximizing data interpretation; to create an online resource sharing relevant publications; and to promote the development of collaborative research proposals. In doing so, we will facilitate the work of the other WGs.

The work of WG 1 to date has focused on defining the database structures needed to store and structure knowledge, and we are now exploring ways of gathering publications ahead of the database completion. Expect more information on this soon... We have also developed a statement of relevance for SAGA members that links our aims to international policy and the Sustainable Development Goals, this will be useful in grant development as well as publicizing the work of SAGA. Finally, we are contributing expertise to reviews being led by WG 2, as well as working on an overarching review paper on the state-of-the-art based on the first ISSGAP meeting.



WG 1 members during the 1st Joint WG Meeting ir Rethymno in 2018.

Integrated Field Methods & Testing -by Dr Philippe De Smedt The general objective of this WG is to explore, discuss and evaluate integrated approaches focusing geophysical, archaeological and sampling methods with the goal of identifying goldstandard field solu-

tions for data collection. Addressing inherently practically oriented aims and deliverables, WG 2 focusses on combining different invasive and non-invasive field methods to support archaeological research. Over the past year, SAGA and the members of WG 2 have provided the foundation developing goldstandard methodological frameworks and increasing the potential of geophysical approaches to archaeology with stakeholders from different backgrounds. To assure this, two short-term scientific missions have been completed (Dr. Kseniia Bondar and Mr. M. Gazdič), which focused particularly on quantifying magnetic soil properties and understanding the genesis of the magnetic response of archaeological features. Out of these and associated research, preliminary protocols for collecting in-situ data collection have been derived, which are currently being scrutinised and tested further prior to publication. To disseminate field methods to students and stakeholders, a training event was organised in Spain (Burguete), including extensive hands-on training in field conditions, and introductory courses into geophysical methods in archaeology. To facilitate further interaction between SAGA members and external stakeholders, and provide a basis for continued collaboration after SAGA, first steps have been taken to set up an international network of equipment and test sites. Specific emphasis hereby has been on identifying test sites with the possibility for long-term monitoring projects that not only enable testing equipment and training students, but equally allow obtaining fundamental insight into seasonal and more longterm variations in geophysical contrasts of (geo-)archaeological variations.



WG 2 members during the 1st Joint WG Meeting in Rethymno in 2018.

Data Integration, Visualisation & Parameterisation -by Dr Baris Tecimen

Through the end of the 2nd Grant Period, WG3 commenced to pull together the products of the tasks. During the WG meetings in Rethymno

and Prague, the group focused on the definition of the works and subsequent contents to fulfil the desired tasks. At the Rethymno meeting, the group created an activity proposal from top to toe including the content of the data types originated from various sources such as discipline, device, method, and at various structure such as unit, accuracy, dimension, spatiality, scalar, vectoral, and revealing variety of content such as magnetic, chemical, geophysical, structural, visual and so on. The task of the group comprised from the data parametrization and integration, visualization and modelling for the field survey planning. From this point, the WG3 by a majority is focused on the data collection - classification - purification - integration - analysing - modelling and - visualization. In this context; a working plan has been constituted and partially accomplished by group members. A case field survey is being planned and potential real data collection sites for measured variables and soil parameters (by Dr Meriç Aziz Berge). Reviewing the data types to be subjected to further interpretation for modelling and visualization is being performed (by Dr Horák Jan). Furthermore, the review of data correlation from alternative sources or structure is being sought and special reference is being made to the available correlation data for archeological sites and the conclusions drawn so far (by Dr Ivana Smiciklas and Dr Marija Sljivic-Ivanovic). The potential for the various data including the 3D visualization of the synthetic data, simulation of the signals collected by alternative collection technics such as GPR, magnetics has been presented in a case study (by Dr Mercedes Solla Carracelas). A review of available software for forward modelling in geophysics, with a priority to open-source software, is coordinated by Dr Michel Dabas. A common model for modelling will be created including interesting archaeological features and specific soil parameters will be created (by Dr François-Xavier Simon). Data integration is treated from the aspect of linkages of the data and how can the data variety be unified regarding to the link type familiarity and software (by Dr Julien Thiesson).



WG 3 members during the 1st Joint WG Meeting in Rethymno in 2018.

WG4

Training, Dissemination & Outreach -by Dr Agnese Kukela The main objectives of the WG 4 are focused on the demonstration of the benefits of inco porating soil science and geophysics during

excavation planning phase to curators, field archaeologists and students, promotion of the benefits of soil analytical techniques for generating auxiliary data, developing specialist skills and cross-disciplinary capacity and organising practical training of early stage researchers and professionals. WG 4 has 10 members in its team, representing different regions and fields of expertise, which makes the implementation of the tasks even more interesting.

During the first grant period three WG meetings were organised - in Rethymno, Malta and Prague. Jointly with the other working groups a website of COST Action SAGA was developed and launched, to accumulate the most valuable updated information on SAGA's activities. Additionally in July 2019 the first training school was organised, focusing on practical skills in use of Geophysical and Soil Science methods in Archaeology.



WG 4 members during the 1st Joint WG Meeting in Rethymno in 2018 (above) and the 2nd Joint WG Meeting in Prague in 2019 (below).

NTNU

UPCOMING EVENTS & OTHER OPPORTUNITIES

World archaeo-geophysics: state of the art & case studies (COST Action SAGA-CA17131) SESSION #21-4 Organises: Cames Cance Garsia (Norwegian University of Science and Technology - NTNU, Norwegi, Andrei Acardulasei (University / Nexandru Ioan Carl McSt, Romania), Anterei Lowe (University of Gasensland, Australia)

Geophysical prospection currently stands as a powerful method in archaeology to study sites in a non-destructive and minimally invasive manner. In the last decade, major tech-nological developments have delivered more compact sensors, multi-arrays systems, as well as motorised or robotised ground or aerial platforms that are revolutionisin ological research. These technological breakthroughs have allowed the imple ising archa

our to di



ts to SESSION #21-4 by 21 March 2020

https://www.wac-9.org/call-for-papers/

POSTPONED DUE TO COVID-19 OUTBREAK (new dates: 4-9 July 2021 @ Prague, Czech Republic)

(SAGA) was funded by the EU COST Association. COST Action SAGA (CA17131) is a research network, which brings together archaeologists, geophysicists and soil scientists from 36 countries. This session is organised under the auspices of COST Action SAGA and is open for contributions (overviews or case-study papers) from SAGA and WAC members, or other external participants working in archaeo-geophysics in research, man-agement or commercial environments, all around the world. We aim to exchange experi-ences, discuss common and/or specific challenges and solutions, and identify pathways to facilitate the adoption of archaeo-geophysics especially in those countries with high needs- and where the expertise and infrastructures are not readily available.

ds: archaeological geophysics/archaeo-geophysics, near surface geophysics, combined archa physical and soil science approaches, cultural heritage management, non-destructive methods

Call for papers 26th European Association of Archaeologists Annual Meeting, Budapest (26-30 August 2020)

Session #35_Building up the momentum in archaeo-geophysics: the "Soil science & Archaeo-Geophysics Alliance" (COST Action SAGA-CA17131)

Carmen Caence Carna (NTNL Noway), Apothtics Sams (University of Cyg h and Technology, Helias, Greece), Clare Wilson (University of String, UN). P nt University, Belgium), Jan Honak (Greech University of Life Belences, Greech

Taking into account the current deluge of societal challenges (dimate change, conflict, economic crisis, inter alia) the development of teid solutions and best practice to record archaeological assets in a more sustainable manner (i.e. using less invasive, rapid and oost effective approaches) is an obvious priority in cultural heritage management. In this context, the employment of geophysical techniques has become a powerful ap-proach in archaeological discovery, characterisation and monitoring in the last decide, geophysical methods have developed rapidly, based on phenomenal breakthroughs in technology. Now, large multi array instruments can be vehicle towed or more compact sensors mounted on robotised vehicles. This has enabled ever faster and higher reso-lation geophysical characterisation of larger areas, increasing the efficiency of subsur-face archaeological investigations and allowed the exploration of what were, previous-by, challenging or inaccessible sites.

This exciting technological momentum calls for further progress in field method opti-misation and data interpretation solutions to ensure a sustainable development of the discipline of archaeo-geophysics. How efficiently can we analyse, interpret and clas-sity massive geophysical datasets (Big geodata)? How can we improve data integra-tion generated by multi-variate approaches? Which strategies can we follow to provide more confident and archaeologically meaningful interpretations of geophysical data-sets? How can we optimise the methodologies in terms of the environmental condi-tion? These are some of the challenous that anchaeo-geophysics is currently favior. ions? These are some of the challenges that archaeo-geophysics is currently facing

This session is organised by COST Action SAGA, an international research network bringing together archaeologists, geophysicists and soil scientists to advance geophys-cal data interpretation for archaeological studies. SAGA invites paper proposals on flective or case-study-based work relating to the above-mentioned challenges and

se related uppes. mibined approached using geophysics and soil science to study archaeological esfandscapes beyond bare prospection (i.e. present/absence of features) explaysical characterisation or monitoring of archaeological sites in risk nulti-variated/difficult data: solutions for modelling, analysis and interpretation











an Open Access Journal

Selected papers from the SAGA Workshop 1

Guest Editors Dr. Carmen Cuenca-Garcia, Dr. Hana Grison, Dr. Clare Wilson

30 June 2020

Deadline







COST POLICY FIGURES -by Dr. Mercedes Solla



Training School "Introduction to the use of Geophysical & Soil

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