H2020-MSCA-RISE-2016
Grant Agreement No. 734164

Multifunctional Graphene-based Nanocomposites with Robust Electromagnetic and Thermal Properties for 3D-printing Application

GRAPHENE 3D

H2020-MSCA-RISE-2016 Project, Grant Agreement No. 734164-Graphene 3D, Duration: 01.01.2017 – 31.12.2020

Training School Report

Advanced methods for characterization of graphene-based nanocomposites

MSCA Training school for the ESRs and Innovation Staff

May 26-30 2019 - University of Salerno (ITALY)

Authors of the document		
Name/Beneficiary	*Position/Title*	*Date*
Patrizia LAMBERTI / UniSA	Dissemination Manager	October 5th 2019

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Introduction

This document is the financial report related to the MSCA Training school for the ESRs and Innovation Staff titled “Advanced methods for characterization of graphene-based nanocomposites” performed within the H2020 GRAPHENE 3D project (GA 734164).

The training school was organized by UniSA partner at the University of Salerno (ITALY) on May 26-30 2019.

It involved about 50 researchers, teachers and students, most of them ERs and ESRs of the consortium.

The school was organized along 5 days. In particular, it was an introduction/welcome day, 3 days with lessons-session in the morning and pratical work in the afternoon, with three different laboratory-experience for each day for a total of 9 as in the follow:

1. Mechanical measurements- tensile tests
2. Tunneling AFM
3. XRD
4. TGA
5. Thermal conductivity
6. Raman spectroscopy
7. DC measurements
8. Low frequency characterization
9. Electrochemical measurements

The last Training-school day has been dedicated to the organization of the collected experiemental data in the morning, with the help of the laboratory supervisors, in order to give a “final” presentation in the afternoon.

Moreover, during the Training school the ESRs have been taken part of a poster session, reporting their results within the project, with a competition for the best three posters presentation

The Training school included also social activities that gaven the possibility to strengthen the already existent contacts and to establish new one.

Official text according to DoA and given budget

MSCA Training school for the ESRs and innovation staff on “Advanced methods for characterization of graphene-based nanocomposites” will be organized at month 30, in Salerno, Italy, and hosted by UniSA. The training program will include lectures from the ERs on the major methods and characterization techniques available at the consortium partners.

For cover the expenses of this activity, ImechBas sent toUnisa partner € 20.000,00 as planned in the project.

H2020-MSCA-RISE-2016
Grant Agreement No. 734164

Program

MSCA Training school for the ESRs and Innovation Staff

"Advanced methods for characterization of graphene-based nanocomposites"

European Project Graphene 3D H2020-MSCA-RISE 2016-734164

Multifunctional Graphene-based Nanocomposites with Robust Electromagnetic and Thermal Properties for 3D-printing Application

Sunday May 26 - Opening session	
Salerno City	
15h00	Registration - Ave Gratia Plena
15h30-16h30	Opening and Event presentation - *by P. Lamberti*
16h30	visit to Salerno historical city centre - strating from Ave Gratia Plena
19h30	***street-food Dinner***

Monday May 27 – morphological/structural characterization	
ICARO room (UniSA)	
09h00-9h15	Institutional greatings
09h15-09h30	Training school and Graphene 3D project *by R. Kotsilkova*
09h30-10h30	Nano carbons preparation and characterization *by P. Ciambelli*
10h30-10h45	***coffee-break***
10h45-11h45	Nanocomposites morphological/structural characterization *by G. Guerra*
11h45-12h15	Opening of Poster Corner and Poster Presentation *by ESR*
12h15-14h00	***Lunch***
14h00-14h50	Laboratory MS1 (AFM) - supervisory Vito Speranza
14h50-15h40	Laboratory MS2 -(Instrom) supervisory Gianluca Viscusi
15h40-16h30	Laboratory MS3 - (XRD) supervisory Rosita la Penta
16h30-16h45	***coffee-break***
16h45-18h15	Visit to University facilities
19h00	***Dinner in Salerno city***

Tuesday May 28 – thermal/mechanical characterization	
ICARO room (UniSA)	
09h00-09h30	Graphene-based Polymer Nanocomposites: processing and rheological properties *by R. Andrade*
09h30-10h30	Nanocomposites thermal characterization *by V. Romano*
10h30-11h00	Nanocomposites: barrier properties *by G. Buonocore*
11h00-11h15	***coffee-break***
11h15-12h15	Technology for nanocomposites and 3D structures/devices making and characterization *by E. Ivanov*
12h15-14h00	***Lunch***
14h00-14h50	Laboratory TM1 - (Thermal conductivity) supervisory Carlo Naddeo
14h50-15h40	Laboratory TM2 - (TGA) supervisory Marco Sirignano/Annaluisa Mariconda/ Rosita La Penta
15h40-16h30	Laboratory TM3 - (Raman Spectroscopy) supervisory Claudia Cirillo/Domenico Spina
16h30-19h30	Visit to Ravello
19h30	***Dinner***

Wednesday May 29 – electrical characterization	
Room 145 (DIEM-UniSA)	
09h00-10h00	DC and low frequency characterization *by V. Tucci*
10h00-11h00	3D printed carbon based lossy photonic crystals: is high conductivity of the skeleton the must? by P. Kuzhir
11h00-11h15	***coffee-break***
11h15-12h15	3D Structure and device modeling vs characterization *by P. Lambin*
12h15-14h00	***Lunch***
14h00-14h50	Laboratory E1 - (DC measurements) supervisory Raffaele Raimo
13h30-15h00	Laboratory E2 - (AC measurements) supervisory Giovanni Spinelli
15h00-16h30	Laboratory E3 - (Electrochemical measurements) supervisory Domenico Spina/Claudia Cirillo
16h30	Excursion to Paestum
20h30	***Social Dinner***

Thursday May 30 - Practical work presentation and Conclusion	
ICARO room (UniSA)	
09h30-12h30	Practical work on Data Analysis and results presentation
12h30-13h30	***Lunch***
13h30-15h00	Practical work presentation *by ESR-groups*
15h00-15h30	Best Poster Awards, greatings and conclusions *by P. Lamberti*

List of lectures

Nr	Title	Authors	partner resp.	Presenter
1	*Nano carbons preparation and characterization*	P. Ciambelli	Narrando	Ciambelli
2	*Nanocomposites morphological/structural characterization*	G. Guerra	Unisa	Guerra
3	*Graphene-based Polymer Nanocomposites: processing and rheological properties*	R. J. E. Andrade, L. G. Amurin, Y. D. C. de Oliveira, P. A. R. Múnoz, F. F. Valim, G. K. de Oliveira, E. H. C. Ferreira, G. J. M. Fechine	McGraph	Andrade
4	*Nanocomposites thermal characterization*	romano	Unisa	Romano
5	*Nanocomposites: barrier properties*	G.G. Buonocore and M. Lavorgna	CNR	Buonocore
6	*Technology for nanocomposites and 3D structures/devices making and characterization*	E. Ivanov, R. Kotsilkova, P. Angelova, R. Ivanova, Dz. Menseidov, T. Batakliev, V. Georgiev, R. Di Maio, C. Silvestre, Y. Chen, H. Xia	NanotechLab	Ivanov
7	*DC and low frequency characterization of nanocomposites*	V. Tucci	Unisa	Tucci
8	*3D printed carbon based lossy photonic crystals: is high conductivity of the skeleton the must?*	P. Kuzhir	INP	Kuzhir
9	*Electrical properties of 3D structure and device modeling versus characterization*	Ph. Lambin, A.V. Melnikov and M. Shuba	Namur	Lambin

List of poster presentation

Nr	Title	Authors	partners	Presenter
1	ULTRASOUND EXFOLIATION OF GRAPHITE IN BIPHASIC LIQUID SYSTEMS CONTAINING IONIC LIQUIDS Study on the conditions for obtaining large few-layers graphene	A. P. Godoy, L. S. Rocha, K.D. Donato, R. K. Donato	McGraph	A. P. Godoy
2	ELECTROMAGNETIC PROPERTIES OF THREE-PHASE EPOXY/MWCNT/ALUMINUM COMPOSITES FROM STATICS TO MICROWAVE	D. Meisak, D. Bychanok, G. Gorokhov, A. Fedarenka, A. Cataldo, S. Bellucci and P. Kuzhir	INP	Meisak
3	Nanocarbon-based SLS 3D-printed structures for electromagnetic shielding applications	G. Gorokhov, D. Bychanok, A. Plyushch, P. Kuzhir, J. Macutkevic, H. Xia, M. Lavorgna	INP-CNR	Gorokhov
4	EFFECTS OF GRAPHENE NANOPLATELETS ON THE STRUCTURE AND RHEOLOGICAL PROPERTIES OF POLY(LACTIC) ACID COMPOSITES	Radost Ivanova, Rumiana Kotsilkova, Evgeni Ivanov, Guilhermino Fechine, Ricardo Andrade, Andressa Oliveira	Imech-BAS - McGraph	Ivanova
5	Investigation of mechanical and thermal properties of PLA-based composites with carbon nanotubes and graphene nanoplatelets prepared by two processing methods	P. Angelova, R. Kotsilkova	Imech-BAS	Angelova
6	ELECTROMAGNETIC AND THERMAL PROPERTIES OF NANOCARBON/POLY(LACTIC) ACID FOR 3D PRINTING	Giovanni Spinelli, Patrizia Lamberti, Vincenzo Tucci, Carlo Naddeo, Vittorio Romano, Liberata Guadagno, Renata Adami, Rumiana Kotsilkova, Evgeni Ivanov, Dzhihan Menseidov and Polina Kuzhir	UniSA - ImechBAS - NanotechLab	Spinelli
7	STUDY ON ANNEALED AND RECOVER OF POLYLACTIC ACID COMPOSITE FILMS WITH GRAPHENE AND CARBON NANOTUBES PREPARED BY MELT EXTRUSION	Rosa Di Maio, Clara Silvestre, Chiara Santillo, Marino Lavorgna, Rumiana Kotsilkova	CNR- ImechBas	Di Maio
8	HAVOH-MWCNT NANOCOMPOSITES FOR FDM APPLICATION	C. Santillo, M. Lavorgna, A. P. Godoy, R. Donato, R. Andrade, G. Buonocore, A. Sorrentino, H. Xia	CNR - Sichuan - McGraph	Santillo
9	NANO MATERIALS AS INNOVATIVE PRODUCTS DEVELOPED BY NARRANDO	Paolo Ciambelli, Giovanni La Guardia and Luca Vitale	Narrando	La Guardia
10	Shelf-life of PLA filaments filled with graphene and carbon nanotubes produced by solution blending	R. Adami, P. Angelova, T. Batakliev, P. Lamberti, R. Kotsilkova	Unisa - ImechBas	Adami

List of awards-winners

Title	Authors	partners	Presenter		
ULTRASOUND EXFOLIATION OF GRAPHITE IN BIPHASIC LIQUID SYSTEMS CONTAINING IONIC LIQUIDS Study on the conditions for obtaining large few-layers graphene	A. P. Godoy, L. S. Rocha, K.D. Donato, R. K. Donato	McGraph	A. P. Godoy	1st	300 €
EFFECTS OF GRAPHENE NANOPLATELETS ON THE STRUCTURE AND RHEOLOGICAL PROPERTIES OF POLY(LACTIC) ACID COMPOSITES	Radost Ivanova, Rumiana Kotsilkova, Evgeni Ivanov, Guilhermino Fechine, Ricardo Andrade, Andressa Oliveira	Imech-BAS - McGraph	Ivanova	2nd	200 €
ELECTROMAGNETIC AND THERMAL PROPERTIES OF NANOCARBON/POLY(LACTIC) ACID FOR 3D PRINTING	Giovanni Spinelli, Patrizia Lamberti, Vincenzo Tucci, Carlo Naddeo, Vittorio Romano, Liberata Guadagno, Renata Adami, Rumiana Kotsilkova, Evgeni Ivanov, Dzhihan Menseidov and Polina Kuzhir	UniSA - ImechBAS - NanotechLab	Spinelli	3rd	100 €

Costs provisional and effective

			provisional	effective
	unitary cost	number	total	
hotel reservation for 30 guest at 45€/night	1.350,00 €	5	6.750,00 €	3.329,99 €
transfer hotel-University and excursion	300,00 €	5	1.500,00 €	1.240,00 €
touristic events	1.000,00 €	2	2.000,00 €	765,85 €
welcome cocktail	550,00 €	1	550,00 €	389,99 €
coffee-break	200,00 €	5	1.000,00 €	640,00 €
lunch/dinner at canteen	300,00 €	5	1.500,00 €	960,01 €
social dinner	2.000,00 €	1	2.000,00 €	1.320,00 €
street-food dinner	600,00 €	1	600,00 €	500,01 €
participant kit	20,00 €	30	600,00 €	1.027,85 €
awards	800,00 €	1	800,00 €	600,00 €
not-UniSa invited/lecturers cost*	300,00 €	9	2.700,00 €	- €
contribute to the involved laboratories	600,00 €	9	- €	5.400,00 €
total			**20.000,00 €**	**16.173,70 €**
residual				**3.826,30 €**

In this cost are included also the expenses for the MB/MC meeting of May 30 2019

All the document justifying these expences are in the administrative office of UniSa partner being it the respopnsible of the training school. Unisa will keep these record for at least 5 years after the end of the project.

In the following the list of the document as they are registered in the Unisa Administrative office

Report Gestione Economica del Progetto

Dati aggiornati al: 2019-10-01 19:04:11.0

Attributi progetto selezionato

Codice Progetto 300638H202017LAMBERTI

REGISTRA

Tipo DG	Numero Documento di riferimento DG	Numero Registrazione DG	Descrizione dettaglio DG	Descrizione Soggetto	Scritture Gestionali aperte pluriennio (costi)	Numero Registrazione DG Ordinativo
Ordine		59	servizio di visita guidata in inglese a Paestum - Lamberti	LE NUVOLE SOC. COOP.	100,00	
Ordine		64	PASTI PER 30 PARTECIPANTI MSCA TRAINING SCHOOL GRAPHENE3D	ITACA RISTORAZIONE E SERVIZI SRL	0,37	
Fattura Acquisto	180/2019	65	PENNA A BIRO SERIGRAFATA 1 COLORE	CARTOLERIA TIPOGRAFIA LA CHIOCCIOLA	18,30	9475
Fattura Acquisto	180/2019	65	PORTA BADGE CON LACCETTO	CARTOLERIA TIPOGRAFIA LA CHIOCCIOLA	48,80	9475
Fattura Acquisto	180/2019	65	CARTELLINA A/4 CON ELASTICO ED ETICHETTA AD. STAMPATA	CARTOLERIA TIPOGRAFIA LA CHIOCCIOLA	45,75	9475
Fattura Acquisto	180/2019	65	1.000 FOGLI CARTA INTESTATA A4 A COLORI	CARTOLERIA TIPOGRAFIA LA CHIOCCIOLA	97,60	9475
Fattura Acquisto	29	71	N. 5 CAMERE SINGOLE PER 5 NOTTI	SERENITI SRL	1.249,99	10429
Fattura Acquisto	29	71	N. 2 CAMERE SINGOLE PER 7 NOTTI	SERENITI SRL	700,00	10429
Fattura Acquisto	29	71	servizi accessori del 26/05/2019	SERENITI SRL	389,99	10429
Fattura Acquisto	29	71	SERVIZI ACCESSORI DEL 27/05/2019	SERENITI SRL	500,01	10429
Fattura Acquisto	54-FE	72	- Cena Stabilita CIG ZC228A1B0D Cod.Articolo S194	RISTORANTE NETTUNO srl	1.320,00	10430
Fattura Acquisto	12 PA	74	N.1 BUS A VOSTRA DISPOSIZIONE DAL GIORNO 27 AL GIORNO 30 GIUGNO 2019	AGENZIA VIAGGI "DE CESARE" SRL	1.240,00	10433
Fattura Acquisto	54 TER	73	GIORNO 26 MAGGIO 2019 - ESCURSIONE A SALERNO CON GUIDA TURISTICA IN LINGUA INGLESE - BIGLIETTI INGRESSO MUSEI-	AGENZIA VIAGGI "DE CESARE" SRL	220,00	10433
Fattura Acquisto	43/2019	75	2 Adulti	STARGATE s.r.l.	165,00	10435
Fattura Acquisto	43/2019	75	Soggiorno dal 29/05/2019 al 30/05/2019	STARGATE s.r.l.	1.215,00	10435
Fattura Acquisto	300/PA	79	PASTI PER 30 PARTECIPANTI MSCA TRAINING SCHOOL GRAPHENE3D	ITACA RISTORAZIONE E SERVIZI SRL	959,64	11770
Fattura Acquisto	5	95	N 5 Coffè Break - Lamberti	Digiesse S.a.s. di Sessa Giacomo & C.	640,00	13494
Generico Uscita		54	Rimborso spese fondo economale LAmberti PAtrizia	PASSEGGIATO Luigi	6,80	15802
Generico Uscita		54	Rimborso spese fondo economale LAmberti PAtrizia	PASSEGGIATO Luigi	19,05	15802
Generico Uscita		54	Rimborso spese fondo economale LAmberti PAtrizia	PASSEGGIATO Luigi	20,00	15802
Fattura Acquisto	204606	128	Stampante Espon A3/A4 WF-8090DTW/e	CONVERGE S.p.A	463,60	20059
Fattura Acquisto	204606	128	Cartuccia NERO 10.000 copie	CONVERGE S.p.A	46,36	20059
Fattura Acquisto	204606	128	Cartuccia CIANO 7.000 copie	CONVERGE S.p.A	82,96	20059
Fattura Acquisto	204606	128	Cartuccia MAGENTA 7.000 copie	CONVERGE S.p.A	82,96	20059
Fattura Acquisto	204606	128	Cartuccia GIALLO 7.000 copie	CONVERGE S.p.A	82,96	20059
Fattura Acquisto	204606	128	Vaschette recupero 50.000 copie	CONVERGE S.p.A	24,40	20059
Fattura Acquisto	204606	128	Estensione garanzia Epson 24 mesi	CONVERGE S.p.A	34,16	20059
		xx	cena MSCA TRAINING SCHOOL GRAPHENE3D ritorno da Ravello	Mi Carrò	400,00	
		xxx	awards	3 winner	600,00	
		xxxx	laboratories contributes	DIIN-DIEM-DCB	5.400,00	
					16.173,70	

Conclusion

A total expense of € 16.173,70 was made with respect a provisional budget of € 20.000,00.

It means that there is a **"cash surplus" of € 3.826,30**

Moreover, the training school receive a positive evaluation from the coordinator: "*I think that the benefit for the participating ESRs and ERs from the lectures, experimental work, final presentations and social contacts will be very high*" and from the attendees as confirmed by the 42 participants to the closing ceremony that have been taken part of the survey represented in the following figure