1506
UNIVERSITÀ
DEGLI STUDI
DI URBINO
CARLO BO

COMPETITION FOR YOUNG RESEARCHERS (age limit 40 years old)
AT THE URBINO UNIVERSITY
SUPPORTED BY ACRI "YOUNG INVESTIGATOR TRAINING PROGRAM 2018"

Attachment 1

Application form

The following declarations are given according to articles 46 and 47 of D.P.R. n. 445/2000.

Title:

Name and Surname: Yang Liu

Date of Birth:

E-mail:

Phone number:

Home Address (residence)**:**

Languages skills (please speficy English, French or Italian)**:**

I carry out research activities in the following areas: ☑ **Non Linear Analysis** ☐ **Calculus of Variations** ☐ **Algebraic Geometry**

Affiliation (University, Research Center, ecc.)**:**

Role (e.g. adjunct professor, phd fellow, etc ... ; please specify starting date and end date)**: Contact Person at the affiliated Institution:**

Proposed title for the conference talk

Brief Abstract (max 5 lines)**:**

Settore Ricerca e Terza Missione
Ufficio Ricerca e Relazioni Internazionali
Via Valerio, 9 – 61029 Urbino (PU)
Tel. +39 0722 305330-4403-4404
ricerca@uniurb.it

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Selected hosting institution (please see the list of host institutions):

1st choice:

2nd choice:

3rd choice:

4th choice:

5th choice:

Proposed visiting period:

Please fill in the following details (insert additional fields if needed)

EDUCATION			
Title			
Institution			
Title		*Date*	
Institution			
SCHOLARSHIPS & PRIZES			
Title			
Awarding Institution			
Title		*Date*	
Awarding Institution			
WORK EXPERIENCE			
Titl			
Title			

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PUBLICATIONS (max 20)

1)

2)

3)

PROPOSED RESEARCH PROJECT DURING THE VISITING PERIOD (max 30 lines)

The proposed project deals with the insurgence of reversible bifurcations in thin films of soft materials, leading to large variations of surface morphologies. The interest in this topic descends both from important phenomena in biological and medical sciences (biological growth and tumor diseases) and from increasing applications in various technological fields such as soft robotics, biomimetic materials, soft sensors, 3D and 4D printing, etc. In this proposal, based on asymptotic methods in the framework of nonlinear elasticity, we intend to study wrinkling and bulging effects in both homogeneous and heterogeneous soft materials. We aim to construct accurate relations between material properties and the geometric properties of the bifurcated configurations. In particular, we will determine the critical bifurcation load and the corresponding critical modes as a function of both geometrical and constitutive properties.

The aim of the proposed study is to provide insights into growth induced pattern formation in biomaterials with applications to both biological and biomedical phenomena. Moreover we aim to deliver solid foundation for the design of variable stiffness materials for application to the design of new graded materials and to new metamaterials. Indeed, by solving an inverse problem analytically, we may design the modulus distribution function to achieve specified bifurcated shapes. These results will be the starting point for an effective design of new materials in the field of soft robotics, MEMS and NEMS.

We emphasize that the proposed project needs certain mathematical theories and asymptotic techniques, for instance, bifurcation theory, dynamical systems theory, non-linear PDEs.(partial differential equations) with variable coefficients, Wentzel –Kramers –Brillouin method, Stroh method, etc. It is therefore important to put in evidence that the proposed arguments at the center of my research interest will take great advantage by the cooperation with the research group in the Politecnico of Bari that has a long tradition in this field.

Signature

Submit your application and enclose, as separate files, a copy of your passport/ID card reporting personal details, and a full CV.

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