

# IAJES Conference

July 5 - 8 2018  
DEUSTO - BILBAO

## Call for Workshops contributors

The workshops are keys activities of the conference : 2 workshops on societal issues, 1 on general training of the future engineers.

Every workshop is focused on a main topic. It allows an overview on orientations and practices achieved in several JES. The main objective is to become more conscious of the richness and variety of our resources in order to strengthen our ability to cooperate and tackle greater challenges together.

*“How can we leverage our faculties in a variety of disciplines to address economic and environmental justice issues” Priority issue IAJU*

	THURSDAY 7/05/2018	FRIDAY 7/06/2018	SATURDAY 7/07/2018	SUNDAY 7/08/2018		
			Eucharist Celebration			
9 am		Fr. GARANZINI : IAJU, Priority issues, specific role of engineers TF - WHO ARE WE: Original presentation of profiles and expertises of JES	TF : Link with previous day - summarise			
10 am		SPEAKER TBD : Societal challenges, new paradigms and focus for Engineering	<b>Intro : Training of Engineers for a societal change</b>	Task Force & Steering committee : junction and transfert,		
11 am			Ignatian core		Entrepreneurship	Project Management
12 am						
1 pm				Socialization		
2 pm		TBD - Laudato Si : Guideline for Engineers	TF : Previous workshops Summary			
3 pm		TF : Introduction Workshops :	TBD : Perspectives & First Actions WORKSHOPS			
4 pm		WATER	ENERGY		CITIES	FACTORY 4.0
5 pm			Fr. GARANZINI : IAJU / IAJES perspectives			
6 pm	Welcoming and registration	CITIES	BIOENGINEERING	WATER	ENERGY	
			TBD : Association Bylaws Steering Committee (members...)			
			TBD : Back-up on the conference - Summarize - Conclusion			
			Visit DEUSTO Labs			
Evening	Dinner	Dinner	Dinner	Adaptations may occur on this schedule		

# How to prepare a Workshop contribution

**The contributor will present on the specific topic of the workshop :**

- Significant realisation in scientific teaching, case studies or research activities or projects in link with university economic and social surroundings ;
- Assesment of these actions [technical efficiency, environment impact, social contributions...]

## Workshop sequence

- Duration : 90 mn
- **3 contributors with prepared content for a speech 15/20 mn on a significant realisation in their university** [on the pattern of TED's talks]
- **Debate : 30 mn**
- One secretary which records the minutes of the debate
- One time keeper

## Steps toward the conference

- **April 30** : Deposit of un abstract
- **Mai 15** : Feed-back from the task force which coordinates workshops and contributors
- **June 30** : Deposit of the full paper for sharing to the IAJES members

# Challenges for the future

**WATER**

**ENERGY**

**CITIES**

**FACTORIES OF THE FUTURE**

**BIOENGINEERING**

# WATER

“Today, 768 million people (11% of the world population) do not have ready access to clean water. Almost 2.5 billion people live without adequate sanitation facilities. Unless we change the way we use water, it is estimated that by 2025, 1.8 billion people will live in areas of severe water scarcity and two-thirds of the world’s population will have dangerously stressed water supplies.”

***Healing Earth - Water and Ethics***

“Access to safe drinking water is a basic and universal human right, since it is essential to human survival and, as such, is a condition for the exercise of other human rights. Our world has a grave social debt towards the poor who lack access to drinking water, because they are denied the right to a life consistent with their inalienable dignity.”

***Laudato Si***

# WATER

## Non-exhaustive list of potential contributors JES

- **Javeriana - Bogota :**  
[CIENCIA E INGENIERÍA DEL AGUA Y EL AMBIENTE](#) - [Master Hidrosistemas](#)
- **Marymount : The Coastal Research Institute (CRI)**  
<http://cse.lmu.edu/research/cri/>
- **Marquette : GLOBAL WATER CENTER**  
<http://www.marquette.edu/innovation/global-water-center-projects.php>
- **Chicago : Research field : Aquatic Ecology**  
Focused on the Great Lakes, streams and inland lakes of our region, our research addresses the health of aquatic ecosystems, the causes of degradation, and the feedback impacts on human health
- **St Louis - Research field : [Water Quality and Treatment](#)**

## Other resources

- **WATERSTART incubator Las Vegas**  
<https://waterstart.com/category/waterstart-news/>

# ENERGY

Energy systems are major drivers of climate change worldwide

## ***More energy justice***

The availability of energy directly correlates to quality of life [health, food security, transportation, buildings...] With 1.2 billion people lacking adequate access to reliable energy, we must find ways to increase that access, but without accelerating climate change.

## **In a radical different “decarbonize” way**

Fundamentally reimagining energy provides the opportunity to create livelihoods and jobs, and enrich cultural practices.

***Laudato si challenge***

## **Shifting from Non-renewable to Renewable Energy**

Today, the principal challenge concerning energy is how to make the necessary shift from non-renewable to renewable energy, a shift that is long overdue. As noted above, this challenge is not solely a matter of changing energy technologies. It is also a matter of changing social systems and lifestyle habits. The dominant patterns of life, both individual and institutional, that have existed for two hundred years in developed countries will need to change.

***Healing Earth***

# ENERGY

## Non-exhaustive list of potential contributors JES

- **U Sophia Tokyo** : "Green Engineering" program, Institute for Studies of the Global Environment, Institute of Global Concern(IGC)
- **COMILLAS Madrid** : [Institute for Research in Technology \(I.I.T.\)](#) : Energy
- **ESIB - Beyrouth**
- **LICET - Chennai - India**
- **University Uruguay - Montevideo** : [Gerencia de la Energía](#)
- **Chicago University** : **Clean Alternative Energy** : [Zero Waste Process](#) ; [BioSoap Production](#)
- **Marquette University** : [Energy](#)

# CITIES

In 2014 there were 28 known mega-cities—those with ten million or more residents—a number that is also expected to increase (United Nations, 2014). This pressure on urban populations will bring numerous challenges, but it also can provide opportunities to address them through innovative public policies.

***Build and reinvent our urban communities with an eye on carbon neutrality and resilience in the face of climate change in ways that are inclusive, value local knowledge and culture, and provide opportunity for all to flourish, regardless of income or identity.***

Structure emerging cities to meet the housing, food, and transportation needs of their populations in carbon-neutral ways.

***Laudato si challenge***

147. Authentic development includes efforts to bring about an integral improvement in the quality of human life, and this entails considering the setting in which people live their lives.

150. Those who design buildings, neighbourhoods, public spaces and cities, ought to draw on the various disciplines which help us to understand people's thought processes, symbolic language and ways of acting. It is not enough to seek the beauty of design. More precious still is the service we offer to another kind of beauty: people's quality of life, their adaptation to the environment, encounter and mutual assistance.

151 Interventions which affect the urban or rural landscape should take into account how various elements combine to form a whole which is perceived by its inhabitants as a coherent and meaningful framework for their lives.

***Laudato si***

# CITIES

## Non-exhaustive list of potential contributors JES

- **ATENEO Naga** : Department of Civil Engineering, Center for Community Development, Institute for Environmental Conservation and Research INECAR
- **DEUSTO** : **Sustainable Development & Innovation**  
Research in this area will promote coherent and effective cooperation for sustainable city and regional development.
- **IBERO - Mexico** : **Maestría en Proyectos para el Desarrollo Urbano**
- **ITESO - Guadalajara** : **Master's in Sustainable Cities and Public Spaces - Master's degree in Sustainable Building Projects**
- **Loyola Marymount - Los Angeles** : **The Center for Urban Resilience – CUREs**
- **SEATTLE** : **Urban Sustainability**
- **Chicago University** : **Ecological Restoration and Conservation**
- **Javeriana - Bogota** : **CECATA** (Transport)
- **Sophia University - Tokyo** : **Institute for Studies of the Global Environment - Institute of Global Concern(IGC)**  
Set up in 2010, the IGC conducts interdisciplinary studies of diverse global problems to promote social justices in the world, and attempts to use its findings as a basis for practical activities.
- **LICET - Chennai - India**
- **Pontificia Universidad Católica de Río** : **Engenharia civil - Urbana e Ambiental**
- **St Louis University** : **Transportation**
- **MARYLAND** : **York Road Initiative** : **Building Civic Capacity : Strengthening Commercial Corridor ; Enhancing Youth Development ; Food Security**

# FACTORIES OF THE FUTURE

## What place for humanity ?

The ultimate goal of the factory of the future is to interconnect every step of the manufacturing process. Factories are organizing an unprecedented technical integration of systems across domains, hierarchy, geographic boundaries, value chains and life cycle phases.

To keep up with the rapid pace of advancing technology, manufacturers will also need to invest in both digital technologies and highly skilled technical talent to reap the benefits offered by the fast-paced factories.

**Factory of the future - IEC**

Yet the orientation of the economy has favoured a kind of technological progress in which the costs of production are reduced by laying off workers and replacing them with machines. This is yet another way in which we can end up working against ourselves. The loss of jobs also has a negative impact on the economy “through the progressive erosion of social capital.

**Laudato Si [128]**

# FACTORIES OF THE FUTURE

## Non-exhaustive list of potential contributors JES

- Javeriana : [CEPIT](#) - [SIRP \(innovation - robot\)](#)
- COMILLAS - Madrid  
Industry 4.0 : Applied and quality research for the future industry
- University FEI - Sao Paolo - Brasil : Instituto de Pesquisas e Estudos Industriais
- DEUSTO - Bilbao - Ingeniería para la Sociedad de la Información y Desarrollo Sostenible - [Information and Communication Technologies \(ICTs\)](#)
- ITESO Guadalajara : industrial Process
- Santa Clara University : Center for Innovation and Entrepreneurship ([Frugal Innovation Hub](#), [Latimer Energy Lab](#), [Maker Lab](#), [robotics Systems Lab](#))
- St Louis University : [Haptic and Human-Machine Interfaces](#) ; [Human Factors and Physiology](#)
- Marquette University : [Robotics](#)

# BIOENGINEERING

**Progress in biomedical engineering has never been more rapid and exciting than it is today.** This progress has come hand in hand with technological advancements in electronic and mechanical engineering, computer science, and information and communication technologies (ICT) ... image-guided robotic instruments...anesthetic agents automatically delivered...Post-operative assistive and rehabilitation technologies...With sensors in the home and access to a "cyberphysician"...delivery of healthy genes into the individual cells within the patient's body... replacement of organs and other body parts from an individual's own genome...**There seems to be no limit to what engineering could do further to revolutionize medical practice. In fact, the next generation of biomedical engineers will probably develop things we can't even yet imagine.**

## **FUTURE CHALLENGES IN BIOMEDICAL ENGINEERING - CAETS**

Each year sees the disappearance of thousands of plant and animal species which we will never know, which our children will never see, because they have been lost for ever. The great majority become extinct for reasons related to human activity.

***Laudato SI [33]***

Climate change is already causing major disruption in the earth's ecosystems, as seen in the bleaching and death of coral reefs, and in the major shift in the range and biological cycles of organisms... one-quarter of all land species will be threatened with extinction by 2050.

If the predicted six degrees of warming by the end of the century occurs, the results to ecosystems could be catastrophic.

***Laudato SI Challenge***

Over 3.6 billion years of biological evolution has resulted in the planet's enormously vast array of magnificent life forms. This is Earth's biodiversity. Humans, like all other organisms, rely on all these forms of life for their existence. Ironically, the very existence of this much needed biological variety is now threatened and in danger of extinction due to human activities over the past 200 years.

***Healing Earth - Biodiversity and Science***

# BIOENGINEERING

- Facing these tremendous challenges, how do we prepare the Bioengineers of the next decades?
- Which are our priority issues in research areas?

# BIOENGINEERING

## Non-exhaustive list of potential contributors JES

- **CORDOBA**
- **University IQS Barcelona**
- **Sogang University Korea** : [Department of Biomedical Engineering](#)
- **IQS - Barcelona** : [MASTER'S DEGREE IN BIOENGINEERING](#)
- **University Uruguay - Montevideo** : Department of science and food technology - Electrical biomedical engineering
- **Universidad de Cordoba - Argentina** : Bioinformatics, Bio chemistry, Food technology
- **Universidad Javeriana** : [BIOINGENIERÍA - BASPI - Bioengineering Master](#)
- **St Louis University** : [Biomechanics](#)
- **DETROIT** : [ReBUILDetroit](#), a National Institutes of Health (NIH)
- **Le Moyne Syracuse** : Bioengineering
- **SCRANTON** : [Biophysics](#)

# Training of Engineers for a societal change

**INTEGRAL ECOLOGY TRAINING PROGRAM  
ENGINEERING AND ENTREPRENEURSHIP  
PROJECT MANAGEMENT**

# INTEGRAL ECOLOGY TRAINING PROGRAM

Ignacian core for Engineers cultural, spiritual, human training

*“The ecological crisis is also a summons to profound interior conversion.” [217]*

Laudato Si

*“Many things have to change course, but it is we human beings above all who need to change.” [202]*

*“A great cultural, spiritual and educational challenge stands before us, and it will demand that we set out on the long path of renewal.” [202]*

Laudato Si

# INTEGRAL ECOLOGY TRAINING PROGRAM

## Ignacian core for Engineers cultural, spiritual, human training

What could be new ways to enhance the sense of the common good ? to deepen the understanding and willingness of commitment for the common good ?

How to transmit a knowledge of the catholic social teaching in a profitable way for Engineers ?

What could be the guideline for a cursus with significant lectures and experiences in order to develop these deep capacities ?

*“We lack an awareness of our common origin, of our mutual belonging, and of a future to be shared with everyone. This basic awareness would enable the development of new convictions, attitudes and forms of life.” [202]*

# INTEGRAL ECOLOGY TRAINING PROGRAM

Ignacian core for Engineers cultural, spiritual, human training

## Non-exhaustive list of potential contributors JES

- **Gonzaga** Institute for Hate Studies - Communities for Justice
- **SAN FRANCISCO** - CHANGE THE WORLD FROM HERE - PASSION FOR JUSTICE
- **FAIRFIELD** CENTER FOR FAITH & PUBLIC LIFE - to prepare students to be global citizens  
CENTER FOR IGNATIAN SPIRITUALITY
- **Seattle University** - Matteo Ricci College - HUMANITIES FOR LEADERSHIP - Center for Environmental Justice and Sustainability
- **SOPHIA - TOKYO** : Institute for Studies of the Global Environment - Institute of Global Concern(IGC)
- **ICAM**
- **DETROIT** : Institute for Leadership and Service to engage in social change for the common good.

Feed back and prospects for :

[Healing Earth](#)  
[Ecojesuit](#)

# ENGINEERING AND ENTREPRENEURSHIP

***“Productive diversification offers the fullest possibilities to human ingenuity to create and innovate, while at the same time protecting the environment and creating more sources of employment. Such creativity would be a worthy expression of our most noble human qualities, for we would be striving intelligently, boldly and responsibly to promote a sustainable and equitable development within the context of a broader concept of quality of life.” [192]***

***In order to continue providing employment, it is imperative to promote an economy which favours productive diversity and business creativity. [129]***

**Laudato Si**

# ENGINEERING AND ENTREPRENEURSHIP

**Engineers have a key role to play in addressing the “Laudato si” challenges !**

New opportunities for creativity

Another form of progress and global development to be conceived ... more diversified and innovative;

Research and creativity focused on priority issues

Creative entrepreneurship for job creation or preservation

Privileged care for the weaks and the poorest....

**How do we prepare this engineers entrepreneurs for a new model of development?**

# ENGINEERING AND ENTREPRENEURSHIP

## Non-exhaustive list of potential contributors JES

- **Santa Clara University : Center for Innovation and Entrepreneurship** ([Frugal Innovation Hub](#), [Latimer Energy Lab](#), [Maker Lab](#), [robotics Systems Lab](#))
- **Xavier University - ATENEO Philippines** : *Community Collaboration* : developmental paradigm shifts and inclusive growth for the community at large.
- **ATENEO - Manilla** : Ateneo Center for Social Entrepreneurship (ACSent) - [Ateneo Innovation Center \(AIC\)](#)
- **ESIB - Beyrouth**
- **Gonzaga - Spokane** : [Center for Engineering Design & Entrepreneurship](#)
- **Marquette University** : [KOHLER CENTER FOR ENTREPRENEURSHIP](#)

# PROJECT MANAGEMENT

*“In any discussion about a proposed venture, a number of questions need to be asked in order to discern whether or not it will contribute to genuine integral development. What will it accomplish? Why? Where? When? How? For whom? What are the risks? What are the costs? Who will pay those costs and how?”*

[185] **Laudato Si**

**New skills are required for the managers of projects according to the guidelines of Laudato Si :**

- Engineers will be able to Sustain the proper self dynamic of local actors,
- Skilled on “integral ecology” project management
- Able to think global to tackle the complexity of ecosystems
- Enhanced expertise in social processes
- Enhanced ability in mediation and making collective decisions
- ...

**How do we prepare these managers of the future?**

# PROJECT MANAGEMENT

## Non-exhaustive list of potential contributors JES

- **DETROIT** : [Center for Automotive Systems Engineering Education](#) is designed to foster student teamwork on collaborative projects including competitive vehicle design, robotics and autonomous vehicle development.
- **SCRANTON** : [Engineering Management](#) -The study of business, economics, physics and electrical engineering for a management role in the technology sector.
- **Fairfield University** : The Master of Science in the Management of Technology (MSMOT)
- **Sophia University - Tokyo** : Institute for Studies of the Global Environment - Institute of Global Concern(IGC)
- .....

**Many thanks  
for your interest and contribution !**