

# Development of Origami & Kirigami based Electronics

**Date:** Tuesday, September 14, 2021

**Time:** 01: 10 PM – 02: 00 PM

**Location:** Bldg. 59-2015

## Speaker:

**Dr. Jhonathan P. ROJAS**  
Assistant Professor EE Department  
KFUPM

## Abstract:

Origami and kirigami are the well-known techniques of folding and cutting paper to build diverse artistic structures. Nowadays, however, these techniques are increasingly being used in science and engineering, bringing a new perspective to approach diverse challenges. On the other hand, new technological trends are bringing flexibility and foldability to our everyday electronic devices. For instance, second generation foldable smartphones are already appearing in the market and are set to generate a great impact. Given that origami and kirigami techniques align very well with this trend, there is a great potential to engage them in complementing this kind of novel technologies or even enable the development of other unique applications. In my talk, I will discuss three different implementations inspired in origami and kirigami techniques. First, I will talk about the transformation of silicon, a well-known brittle material, into an ultra-stretchable, spiral-based structure. Second, I will explore the transformation of a thermoelectric generator (TEG), combining organic and inorganic materials, to demonstrate the implementation of a foldable and stretchable TEG. Third, the journey in the development of a flexible and stretchable printed circuit board (PCB) will be discussed. Finally, I will discuss how all these techniques and demonstrations might help in the further development of technologies such as flexible, stretchable, and wearable electronics.

## Bio:

**Jhonathan Prieto Rojas** received his bachelor's degree in electronics engineering from the National University of Colombia, including an exchange semester at the Technology University of Munich (TUM) as recipient of the DAAD young engineers' scholarship. He then joined King Abdullah University of Science and Technology (KAUST) in 2009, where he received the KAUST Graduate Fellowship and Provost Award. He completed his master's degree and PhD degree from KAUST in electrical engineering in 2010 and 2014, respectively. Dr. Rojas joined King Fahd University of Petroleum and Minerals (KFUPM) as Assistant Professor in the Electrical Engineering Department from Fall 2015. His research interest includes novel micro- and nanofabrication techniques for energy harvesting and flexible/stretchable/wearable electronics.