17th Math Colloquium BCAM-UPV/EHU

We are glad to announce that the 17th Math Colloquium BCAM-UPV/EHU will take place on **Wednesday, November 6, at 11:45 (CET) at "Sala Aketxe"** of Edificio Sede (BCAM) at UPV/EHU in Leioa.
Lunch will be offered at the end.

11:45-12:45 | María Ángeles Gil: Statistical analysis of fuzzy data with applications to problems involving human judgements

IIn her presentation, she will provide an overview of a mathematically rigorous methodology for the statistical analysis of fuzzy-valued data, developed by SMIRECODIRE. This methodology integrates the foundational ideas of Maurice R. Fréchet concerning random elements with concepts from Lotfi A. Zadeh's fuzzy set theory. The talk will cover various applications of the developed methods, including a functional characterisation of the distribution of a real-valued random variable, offering an enhancement compared to existing approaches. Additionally, real-world applications will be discussed, such as the design and analysis of responses from multiple questionnaires and methods for robust aggregation of expert valuations in the context of Risk Analysis, particularly in relation to Dam Safety Management.

13:00-14:00 | Virginia Kiryakova: Fractional Calculus Based on Special Functionals - I did it my way

There was a legend about the three whales on whom the Earth rests ... For my research studies for about 50 years, such 3 "whales" happened to be Integral Transforms (IT), Special Functions (SF) and Fractional Calculus (FC). Their successful combination led me to a Generalized Fractional Calculus (GFC) and to new classes of special functions called Special Functions of Fractional Calculus (SF of FC). In this talk I will try to survey in popular manner the way this happened, or how "I did it my way". I was to start with a MSc thesis on the IT of Obrechkoff, a very far generalization of the Laplace and Meijer integral transforms, that was to serve for an operational calculus related to higher integer order singular differential operators called hyper-Bessel operators. But occasionally, I came across the classical handbook "Higher Transcendental Functions" of 1954 (eds. A. Erdélyi et al., based on notes left by Harry Bateman). It happened that the kernel functions of the mentioned IT and of the fractional powers of the hyper-Bessel operators can be represented as two different cases of the Meijer G-function. This was the hint to introduce and develop a theory of Generalized Fractional Calculus operators with Meijer G- and Fox H-functions that proved to have a wide range of applications. Then, my increased interest to these SF and in particular, to the Fox-Wright generalized hypergeometric functions resulted in introduction of the multi-index counterparts of the Mittag-Leffler and Le Roy functions, their detailed theory and examples, all these classified as SF of FC.

ABOUT THE SPEAKERS

María Ángeles Gil is an emeritus professor of Statistics and O.R. at the University of Oviedo (Spain). Her research was initially focused on the measurement and statistical developments concerning the statistical information and inequality associated with random variables. Since the beginning of the eighties, her research interests have been mostly related to the statistical analysis of fuzzy set and set-valued data. On this topic she coordinates the Research Group SMIRECODIRE (http://bellman.ciencias.uniovi.es/smire+codire/index.html) in the University of Oviedo. She was co-editor-in-chief of the statistical journal TEST (2005-2008) and she has been associate/area editor for several statistical and computational international journals. She has been awarded with the Silver Medal of the Principality of Asturias in 2014 and the Medal of the Spanish Society of Statistics and O.R. in 2021, and she is an International Fuzzy Systems Association Fellow since 2015, member of the Royal Spanish Academy of Sciences (RAC), elected member of the Asturian Academy of Sciences & Engineering (AACI) and elected honor member of the Royal Institute of Asturian Studies (RIDEA).

Virginia Kiryakova is Professor Emeritus at the Institute of Mathematics and Informatics of the Bulgarian Academy of Science in Sofia. As a secondary school student, in 1969 she was awarded with the bronze medal at the 11 th International Mathematical Olympiad, in 1996 – with the Academic Prize for Mathematical Sciences of the Bulgarian Academy of Sciences, then in 2023 – with a Medal with Ribbon of her Institute. Since her PhD at Sofia University in 1986, she strongly contributed to the development of Fractional Calculus through fundamental publications on generalized differential and integral operators of fractional order (e.g., "Generalized Fractional Calculus and Applications", Longman & John Wiley, Harlow-N. York, 1994) and on new classes of special functions. In 1998, she was a founder and - since then - Editor-in-Chief of the journal Fractional Calculus and Applied Analysis that is the best ranked reference on the topic for applied scientists including mathematicians, statisticians, physicists, engineers (https://link.springer.com/journal/13540). She is also on the list of Top 2% Scientists Worldwide according to the Standford University ranking.