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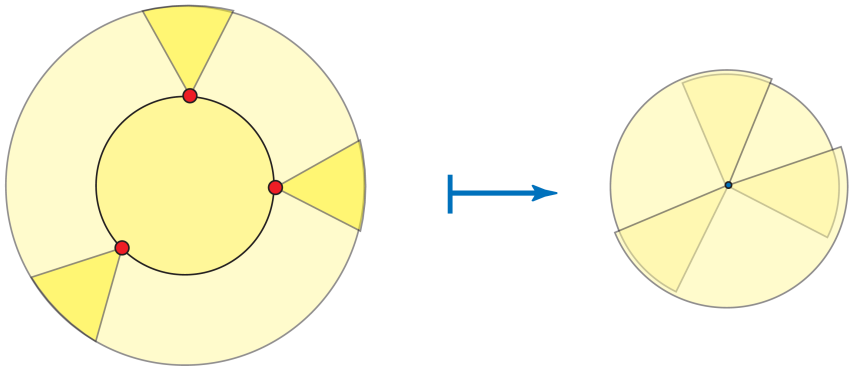

WHAT CAN WE LEARN FROM DIVERGENT SERIES?

Abstract. What can we learn from convergent power series? They provide asymptotics close to the origin, they are useful in numerical computations. Moreover, in the complex domain, a convergent series encodes the complete information on the analytic extension of the function, which is the sum of the series, including its singularities. But, what about divergent series? For centuries, they have been successfully used in mathematics until the call for rigour banished them from most of mathematics. In this lecture, I will discuss the rehabilitation of divergent series in the 20th century, and how we can rigorously justify their use. I will then move to highlighting the very rich information they can provide on the functions that are their "sums". The examples presented come from differential equations.

Christiane Rousseau (Université de Montréal)

Christiane Rousseau obtained her Ph.D. from Université de Montréal in 1977. After a postdoctoral position at McGill University (1977–1979), she joined the faculty at the Université de Montréal and was promoted to Full Professor in 1991. Prof Rousseau was also president of the Canadian Mathematical Society (2002–2004), director of CRM (2008–2009), Vice-President of the International Mathematical Union (2011–2014), and has been serving on the Executive Committee of IMU since 2015. She has received the 2009 Graham Wright Award for Distinguished Service from the Canadian Mathematical Society and the 2014 George Pólya Award of the Mathematical Association of America. In 2012, she became fellow of the American Mathematical Society and, in 2013, she was the initiator and coordinator of the program *Mathematics of Planet Earth*. Christiane Rousseau's research examines low-dimensional dynamical systems, in particular those arising from ordinary differential equations or difference equations.

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