



**UNIVERSITÉ
DE GENÈVE**

FACULTÉ DES SCIENCES

LE DEPARTEMENT DE CHIMIE PHYSIQUE

a le plaisir de vous inviter à la

CONFERENCE

Intitulée

**FROM ULTRA STRONG TO ULTRAWEAK :
REVEALING AND DECODING NON-CANONICAL
HYDROGEN BONDS**

donnée par

Dr. Bogdan DEREKA
UNIVERSITY OF ZÜRICH

le MARDI 21 AVRIL à 16h30

SALLE 1S081
Sciences III

30 quai Ernest-Ansermet ou 4 bld d'Yvoy

Responsable : Prof. Eric Vauthey

Abstract :

A hydrogen bond is an all-familiar concept. Having been studied for more than a century since Lewis coined the term in 1923, by now there are thousands of papers seeking to elucidate this important (inter)molecular interaction. Is it comprehensively understood then? Surprisingly, we don't even have a good definition of a hydrogen bond, and the operational one that most chemists rely on is implicitly based on the so-called Badger's rule. Is this rule universal? Not every hydrogen bond obeys it. What is the alternative? In this talk, I will present our recent explorations across the full spectrum of hydrogen-bonding phenomena: from ultrastrong F-H hydrogen bonds bordering on covalency to ultraweak C-H ones that don't even fit the definition. Using an array of structure-sensitive techniques and state-of-the-art ultrafast time-resolved spectroscopies validated by high-level computer simulations, we reveal the structural, spectroscopic, dynamic, and energetic characteristics of qualitatively different classes of hydrogen bonds, as well as how the environment shapes their character. I will discuss a few examples of how these unconventional hydrogen bonds are proving useful in the context of the current problems in sensing, catalysis and energy science. Even after >100 years of research, this seemingly well-known interaction still holds surprising complexity.