



**IIT MANDI INSTITUTE COLLOQUIUM  
PRESENTS**

# **LOW FREQUENCY ISOLATION OF LARGE CRYOGENIC MIRROR FOR FUTURE GRAVITATIONAL WAVE DETECTORS**



**CHRISTOPHE COLLETTE**  
PROFESSOR, UNIVERSITY OF LIÈGE  
DIRECTOR, PRECISION MECHATRONICS  
LABORATORY

**03.00 PM - 04.00 PM (IST)**

**23rd April, 2022**

**A1-NKN and CVR Guesthouse conference room**

FOR ANY QUERIES, PLEASE CONTACT DR. SRIKANTH SUGAVANAM, CHAIR, INSTITUTE  
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## IIT Mandi Institute Online Colloquium

### *“Low frequency isolation of large cryogenic mirror for future gravitational wave detectors”*

**Speaker – Prof. Christophe Collette,**  
Director, Precision Mechatronics Laboratory, University of Liege

**Date – 23th April 2022, 1700 hrs IST onwards**

#### ***Abstract***

One century after their prediction by Einstein’s theory of general relativity, gravitational waves have been directly detected in 2015. These waves, generated by the coalescence of large massive objects, propagate in the universe, carrying precious information about their source. Although current instruments have reached a tremendous sensitivity, astronomers estimate that a very high payoff will come from an extension of the detector sensitivity at low frequency. In this talk, the limitations of existing instruments will be first reviewed. Then, the talk will focus on current research conducted to bypass these limitations. One of them is the E-TEST project, which proposing new concepts to support large mirrors at cryogenic temperature.

***Online link – TBC***

#### ***About the speaker***



**Prof. Christophe Collette** is currently full professor at University of Liège, and director of the Precision Mechatronics Laboratory. He received a M.Sc. in physics engineering from the University of Liège in 2001 and Ph.D. degree in mechatronics engineering from the Université Libre de Bruxelles in 2007. He is a principal investigator for the LIGO Scientific Collaboration. He has also remained a Fellow at CERN, where he worked on the active stabilization of the future linear collider CLC.

Prof. Collette’s main research interests include the active and passive control of vibration, and large instruments dedicated to experimental physics. His lab, Precision Mechatronics Laboratory (PML), is developing instrumentation and strategies for actively measuring and controlling the vibrations of structures. Over the years, it has developed an internationally renowned expertise in high precision control of large instruments dedicated to experimental physics, including gravitational wave detectors, particle colliders, segmented ground and space telescopes, satellites and light sources. PML is an active member of the collaborations Einstein Telescope, LIGO Scientific Collaboration (LSC), and Lunar Gravitational Wave Antenna (LGWA). You can learn more about the activities of his lab and his associated projects from the following links - Precision Mechatronics Laboratory: <http://www.pmlab.be>; Einstein Telescope: <http://www.pmlab.be/> (follow the links), and <https://www.etest-emr.eu/>, and the E-TEST project: <https://www.etest-emr.eu>

*For any queries, please contact the Institute Colloquium Committee, IIT Mandi, via Dr. Srikanth Sugavanam, [ssrikanth@iitmandi.ac.in](mailto:ssrikanth@iitmandi.ac.in), or Dr. Shashank Pathak, [shashank@iitmandi.ac.in](mailto:shashank@iitmandi.ac.in).*