

# Graduate Course on Tight Closure of Ideals and its Applications



**16 May - 25 July 2022**  
**An ICTP Virtual Meeting**  
**Trieste, Italy**

Further information:  
<http://indico.ictp.it/event/9791/>  
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The aim of the course is to provide training in the foundations of commutative algebra and algebraic geometry in prime characteristic and to present some of the exciting recent developments.

## Directors:

**K. MADDOX**, University of Kansas, USA  
**K. GOEL**, University of Utah, USA  
**M.E. ROSSI**, University of Genoa, Italy  
**N.V. TRUNG**, Institute of Mathematics, Vietnam  
**J.K. VERMA**, Indian Institute of Technology Bombay, India

## Description:

The local theory of prime characteristic singularities is a beautiful and historically important subject. Singularities which are defined in terms of the behaviour of the Frobenius endomorphism have been labeled "F-singularities".

The course gives an introduction on the most prominent F-singularity classes that emerged from Hochster-Huneke's tight closure theory. Since its introduction in the late 1980s, it has had a dramatic effect on the field of commutative algebra.

Tight closure gives unified proofs and strong generalisations of many major theorems in commutative algebra, as well stimulated recent proofs of longstanding conjectures.

## Topics:

- An overview of tight closure of ideals
- Test ideals
- Direct summands
- F-rational rings and rational singularities
- Hilbert-Kunz multiplicities
- Briançon-Skoda Theorems
- Big Cohen-Macaulay algebras
- The absolute integral closure
- Symbolic powers of ideals
- The localisation problem
- Uniform Artin-Rees results

## Local Organiser:

**L. GOETTSCHKE**, ICTP, Italy

## Speakers:

**I. ABERBACH**, University of Missouri, USA  
**F. ENESCU**, Georgia State University, USA  
**N. EPSTEIN**, George Mason University, USA  
**E. GRIFO**, University of Nebraska, USA  
**G. LYUBEZNIK**, University of Minnesota, USA  
**L. MA**, Purdue University, USA  
**T. POLSTRA**, University of Virginia, USA  
**I. SWANSON**, Purdue University, USA  
**V. TRIVEDI**, Tata Institute of Fundamental Research, India  
**K. TUCKER**, University of Illinois, USA  
**W. ZHANG**, University of Illinois, USA

## How to apply:

Online application:  
<http://indico.ictp.it/event/9791/>

Female scientists are encouraged to apply.

## Registration:

There is no registration fee.

## Deadline:

**31 March 2022**

