

Oberwolfach Workshop 1744b

# Copositivity and Complete Positivity

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## Abstract:

A real matrix  $A$  is called copositive if  $x^T Ax \geq 0$  holds for all  $x \in \mathbb{R}_+^n$ . A matrix  $A$  is called completely positive if it can be factorized as  $A = BB^T$ , where  $B$  is an entrywise nonnegative matrix. The concept of copositivity can be traced back to Theodore Motzkin in 1952, and that of complete positivity to Marshal Hall Jr. in 1958. The two classes are related, and both have received considerable attention in the linear algebra community and in the last two decades also in the mathematical optimization community. These matrix classes have important applications in various fields, in which they arise naturally. These fields include mathematical modeling, optimization, dynamical systems and statistics. More applications constantly arise.

The workshop aims to bring together people working in various disciplines related to copositivity and complete positivity, in order to discuss these concepts from different viewpoints and to join forces to better understand these difficult but fascinating classes of matrices.