CLAREMONT CENTER
for MATHEMATICAL SCIENCES

C C M S C O L L O Q U I U M

Hermitian positivity of real polynomials

by

Mihai Putinar

University of California, Santa Barbara

Abstract: Real algebraic varieties embedded into a complex space carry a restrictive notion of hermitian positivity, defined by weighted sums of hermitian square certificates. Tarskis elimination of quantifiers method still yields in this case a powerful, abstract Positivstellensatz, as only recently it was revealed. The lecture will place the new Hermitian Positivstellensatz into a rich historical context, marked by Riesz-Fejér type factorizations, an early discovery of Quillen and rigidity phenomena in complex geometry. A necessary quantization procedure will bring into discussion non-commutative algebras and duality techniques. A series of applications will be briefly presented: a new invariant in Cauchy-Riemann geometry, a hyperbolicity stability criterion for systems of differential equations with delay in the argument, a study of the hermitian structure of the Unitary Extension Principle in wavelet theory with concrete consequences in its turn.

About the speaker: Mihai Putinar is Professor of Mathematics at the University of California, Santa Barbara. He studied mathematics in Bucharest, Romania and worked ten years at the Romanian Mathematical Institute (INCREST). He has been affiliated with the University of California since 1991. He has held numerous Visiting Professor positions in US, Germany, Sweden, France, Israel. Author of two monographs and more than 150 research articles in the fields of Functional Analysis, Complex Geometry and Approximation Theory, he is also the editor of several books and member of the editorial board of half a dozen mathematical journals. Mihai Putinar proved a Positivstellensatz, widely employed today in global, non-linear optimization. He is also known for reshaping Local Spectral Theory on topological-homological foundations. He received the Simion Stoilow prize of the Romanian Academy of Sciences and was recently granted the Order of Merit with the rank of Knight of the Romanian State.

Wednesday, April 4, 2012, at 4:15pm

Freeburg Forum (Kravis Center, LC 62), Claremont McKenna College

Refreshments at 3:45 p.m. in Freeburg Forum Courtyard & wine and cheese after the talk in CMC Math Commons Room (Adams 208)

The dinner will be hosted by Prof. Stephan Garcia.
Please contact Prof. Garcia if you are interested in attending the dinner