

## פרופסור צ'י-וואנג שו

המחלקה למתמטיקה שימושית

אוניברסיטת בראון פרובידנס, רוד איילנד, ארה"ב

## Professor Chi-Wang Shu

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קולוקוויום | Colloquium

## HIGH ORDER NUMERICAL METHODS FOR CONVECTION DOMINATED PROBLEMS

Convection dominated partial differential equations are used extensively in applications including fluid dynamics, astrophysics, electro-magnetism, semi-conductor devices, and biological sciences. High order accurate numerical methods are efficient for solving such partial differential equations, however they are difficult to design because solutions may contain discontinuities and other singularities or sharp gradient regions. In this talk we will survey several types of high order numerical methods for such problems, including weighted essentially non-oscillatory (WENO) finite difference methods, WENO finite volume methods, discontinuous Galerkin finite element methods, and spectral methods. We will discuss essential ingredients, properties and relative advantages of each method, and comparisons among these methods. Recent development and applications of these methods will also be discussed.

The lecture will be held on Monday,  
14 November 2016, at 12:15,  
Room 006, Schreiber Building,  
Tel-Aviv University, Ramat-Aviv

ההרצאה תתקיים ביום שני,  
14 בנובמבר 2016, בשעה 12:15,  
חדר 006, בניין שרייבר,  
אוניברסיטת תל-אביב, רמת-אביב

סמינר | Seminar

## DISCONTINUOUS GALERKIN METHOD FOR CONVECTION DOMINATED PARTIAL DIFFERENTIAL EQUATIONS

Discontinuous Galerkin (DG) method is a finite element method with features from high resolution finite difference and finite volume schemes such as approximate Riemann solvers and nonlinear limiters. It was originally designed for solving hyperbolic conservation laws but has been generalized later to solve higher order convection dominated partial differential equations (PDEs) such as convection diffusion equations and convection dispersion equations. The DG method has been widely applied, in areas such as computational fluid dynamics, computational electromagnetism, and semiconductor device simulations, just to name a few. In this talk we will give a general survey of the DG method, emphasizing its designing principles and main ingredients. We will also describe some of the recent developments in DG methods.

The lecture will be held on Tuesday,  
15 November 2016, at 15:10,  
Room 309, Schreiber Building,  
Tel-Aviv University, Ramat-Aviv

ההרצאה תתקיים ביום שלישי,  
15 בנובמבר 2016, בשעה 15:10,  
חדר 309, בניין שרייבר,  
אוניברסיטת תל-אביב, רמת-אביב

כיבוד קל יוגש לפני ההרצאות | Light refreshments will be served before the lectures