



Berlin
Mathematical
School

BMS Fridays Colloquium

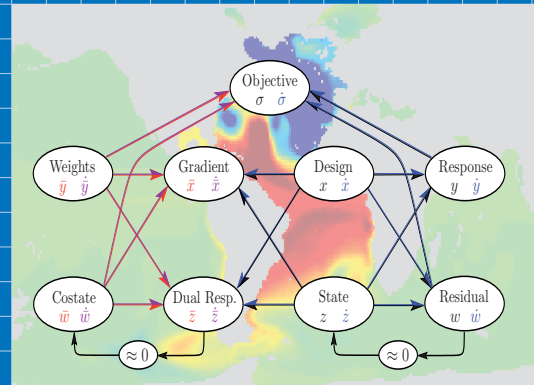
Friday, 23 October 2009, 2:00 pm

Tea before the lecture starts at 1 pm

BMS Loft, Urania
An der Urania 17, 10787 Berlin

Andreas Griewank (HU Berlin):

"Derivative Based Optimization"



Since Cauchy's time standard optimization methods require the evaluation of first derivatives for objective and constraint functions. At least the existence of these gradients and Jacobians is typically needed to ensure convergence for any optimization method that does not simply cover the feasible domain with sample points. The latter shot-gun approach is clearly unsuitable for high-dimensional problems of current interest.

To beat the 'curse of dimensionality' in nonlinear optimization one can exploit the fact that continuous and discrete adjoints alike yield first and second derivative vectors at costs proportional to the underlying function and constraint evaluations. Andreas Griewank will discuss the resulting 'selective derivative methods' in comparison to derivative-free-methods in terms of numerical efficiency, applicability, and user convenience. Finally he will report numerical experiences from aerodynamics and oceanography.

