

# Partial Differential Equations and Virtual Element Method

Annamaria Mazzia \*

*Workshop “Donato Trigiante: il matematico, l’uomo, le idee”*

## Abstract

I remember some interesting explanations made by professor Donato Trigiante when he suggested to solve the Partial Differential Equations (PDEs) with the aim of the Boundary Values Methods (BVMs) and the Method of Lines [1]. After more than 20 years, I don’t work with BVMs anymore, but I continue to work with PDEs by applying the Virtual Element Method (VEM) [2,3,4,5].

In this way, the underlying idea of the beauty of Mathematics is going on, as Trigiante advised in his lectures.

## References

1. A. Mazzia, F. Mazzia, D. Trigiante. Boundary Value Methods for PDEs. *Proceedings of the First International Conference on Nonlinear problems in Aviation and Aerospace*, S. Sivasundaram Editor. Embry-Riddle Aeronautical University Press, 1997, pp.421–436.
2. A. Mazzia. A numerical study of the Virtual Element Method in anisotropic diffusion problems. *Math. Comput. Simulation* 177 (2020) 65–85.
3. A. Mazzia, M. Ferronato, P. Teatini, C. Zoccarato. Virtual element method for the numerical simulation of long-term dynamics of transitional environments. *J. Comput. Phys.* 407 (2020) 109235.
4. G. Manzini, A. Mazzia. A virtual element generalization on polygonal meshes of the Scott Vogelius finite element method for the 2D Stokes problem. *J. Comput. Dyn.* (2021) accepted for publication.
5. G. Manzini, A. Mazzia. Conforming virtual element approximations of the two-dimensional Stokes problem. *Appl. Numer. Math.* (2021) submitted.

---

\*Università di Padova