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Editorial Open Access

Open Computational Fluid Dynamics

Michalis Xenos*

Department of Mathematics, Section of Applied Mathematics and Engineering Research, University of Ioannina

The rapid development of Computational Fluid Dynamics (CFD), computational mathematics and computers have enabled the shift of scientific interest to many new areas of research, such as biomechanics and bioengineering. These advancements in mathematics and technology broadened the scientific horizon and gave the opportunity and the means to many scientists to study non-linear phenomena in physics, mechanics and biology.

The CFD researcher often has to struggle with a non-linear system of equations that describe the physical problem. To study biofluids flow, e.g. motion of blood in arteries, new methods that address the interaction of the fluid with the solid boundary (pulsating wall) are needed [1-2]. The Fluid-Solid Interaction (FSI) makes the mathematics of the biological problems more complex and more difficult to be solved. The FSI approach requires large scale numerical computations, cutting edge computational power, and a new set of mathematical equations that can handle moving boundaries. The equations of fluid motion - Navier-Stokes equations - initially in Euler form have to change in order to describe the fluid motion due to deformation of the solid boundary that surrounds it. So, the Navier-Stokes equations are transformed into Euler-Lagrange form that takes under consideration the motion of the solid surfaces [3-4]. The FSI approach has gained significant momentum over the last decade with promising results in the biomedical field. This growth can be sustained only when open access to knowledge can be available to the entire scientific community.

The CFD community is a fast developing group of researchers with many open source means for the scientists that have led CFD to an impressive growth of knowledge. Further, the CFD community has recognized the need of open access publications which will help many more scientists to reach knowledge and ideas faster. Scientists from developing economies and small companies that do not have access to journal subscription will also benefit greatly.

To facilitate this need many open access journals such as the OMICS' Applied & Computational Mathematics Journal (http://www.omicsonline.org/OpenAccess.php) have started to share knowledge. This journal provides many special features rarely considered by other publishers such as "audio version-enhanced feature", "language translation", "social networking" etc. (http://www.omicsonline.org/special-features.php).

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***Corresponding author:** Michalis Xenos, Department of Mathematics, Section of Applied Mathematics and Engineering Research, University of Ioannina, 45110 Ioannina, Greece, E-mail: mxenos@cc.uoi.gr

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