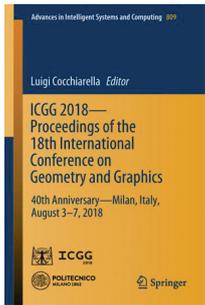


RECENSIONI



LUIGI COCCHIARELLA (EDITOR)
ICGG 2018 –PROCEEDINGS OF THE
18TH INTERNATIONAL CONFERENCE ON
GEOMETRY AND GRAPHICS
40TH ANNIVERSARY - MILAN, ITALY,
AUGUST 3-7, 2018

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In principio erat signum

Whether in the beginning was the Word or the Sign, we cannot say, but the old tenet that *verba volant, scripta manent* implies that sign is the root of civilization. The most recent stage of man cultural evolution in the superior paleolithic age starts with the graphic representation of the world and concepts. The ability to graphically represent what does exist or is just imagination is the source of all forms of knowledge. Arithmetics, geometry, astronomy and music, grouped within the medieval *quadrivium* (the Pascalian *esprit de géométrie*) were integrating the *trivium* (grammar, logic and rethoric, or the *esprit de finesse*): forgetting the nefarious idea of “two cultures”, we may convene that geometry and graphics are the analytical and cognitive tools for every art and science. The famous architect Paolo Portoghesi opened his courses at Milan Polytechnic saying that “architecture is a dream”, implying that the architect is the one who can translate a dream into reality. Architects are therefore not only Brunelleschi and Michelangelo, but much in the same way Dante and Einstein, Kant and Gauss, as well as the infinitude of creative geni who could in any time translate a thought structure into a materially intelligible work and transmissible to others. In this sense also hypertexts, any kind of networks, as well as supporting hardwares and softwares are architectures, as long as they originate from graphs conceived and realized in their complex topologies. Geometry, albeit grounded on measure, gained in its extension to topology and graphs, curved spaces of any dimension and fractals, an enormous representing power, and therefore a creative function.

Such a universal role of geometry and graphics, and of cognitive mechanisms translating perceptions into concepts, models, and therefore creative acts, is the basis on which the series of international conferences *Geometry and Graphics* (ICGG) grew up during the last 40 years, since

the first 1978 ICGG in Vancouver. The 18th edition, masterfully chaired by Luigi Cocchiarella at Milan Polytechnic last August, actually celebrated with these monumental proceedings volumes published a few months ago, the year of Leonardo da Vinci, who spent a good part of his life in Milan and passed away on May 2, 1519 in Amboise, France. Nobody better than Leonardo could translate into a sublime and didactic graphics objects of scientific investigation, as well as projects, models, mechanisms, and even the motion of what existed or was pure fantasy, albeit always inspired by the observation of Nature. Alchemists’ motto, often decorating their *Tabula Affinitatum*, “*non fingendum aut excogitandum, sed videndum quid Natura ferat aut faciat*” (not speculating or inventing, but observing what Nature brings and does) was definitely consistent with Galileian thought that observation and measure are the basis of natural science. The next step, actually anticipated by about a century by Leonardo, and today at the basis of design, from nanoscience to skyscrapers, could actually sound as: “*non modo videndum quod Natura ferat aut faciat, sed etiam fingendum aut escogitandum quod numquam Natura fecit*” (not just observing what Nature brings or does, but also speculating and inventing what Nature never did).

The ICGG-18 honored Leonardo not only in the official opening and concluding ceremonies, in the elegant ICGG-18 logo, where the celebrated Leonardo’s *homo ad circum* masterfully dissolved into Natta’s isotactic polypropylene, but also, and more importantly, with the collection of high-quality, peer-reviewed articles collected in these two beautiful volumes edited by Luigi Cocchiarella, which together sum up to more than 2000 pages. The introducing chapters by Cocchiarella, “*Geometry and Graphics for the Graphic Identity of a Conference on Geometry and Graphics: About the ICGG2018 Conference Logo*”, Matthew Landrus, “*Rational Estimates for Irrational Problems: Proportional Geometry in*

the Work of Leonardo da Vinci”, and Guido Raos, “*Molecular geometry and molecular graphics: Natta’s polypropylene and beyond*” outline very well the conference spirit. Any attempt to summarize the rest of the proceedings or to just highlight the most significant papers in the domain of physics would be absolutely arbitrary, in view of the vast areas of scientific and artistic knowledge covered by geometry and graphics. Just the volume of Extended Abstracts, also edited by Cocchiarella and published by Milan Polytechnic, includes 580 pages (besides the attached CD-ROM digital version). A vague idea on contents comes from the book sections: Theoretical graphics and geometry (with the sub-sections: Geometry of Curves and Surfaces, Kinematic and Descriptive Geometry, Computer Aided Geometric Design), Applied geometry and graphics (with: Modeling of Objects, Phenomena and Processes, Applications of Geometry in Engineering, Art and Architecture, Computer Animation and Games, Graphic Simulation in Urban and Territorial Studies), computerized graphics (with: Computer Aided Design and Drafting, Computational Geometry, Geometric and Solid Modeling, Image Synthesis, Pattern Recognition, Digital Image Processing), Geometry and Graphics in History (with: Concepts of Space and Geometry, Development of Geometry and Graphics, Treatises and Manuals, Masters and Pioneers), and finally graphic education (with: Education Technology Research, Multimedia Educational Software Development, E-learning, Virtual Reality, Educational Systems, Educational Software Development Tools, Massive Open On-line Courses). The strong commitment of Luigi Cocchiarella in graphic education is here worth mentioning by quoting, among the others, the three volumes on *The Visual Language of Technique*, that he edited for Springer in 2015.

One can easily figure out how much theoretical and experimental physics and physical chemistry are nurtured by *geometry and graphics*, and how much the latter benefit

(not purely instrumentally) from physics.
A common denominator shared by several papers of physical interest are the design and visualization of complex topologies and systems, like quasi-crystalline materials, turbulent fluxes, grids and networks, but also the quantum logic of visual perception, etc. Looking at these two volumes we cannot but admire the vast and robust bridge that the ICGG steering, organizing and program committees have cast between the "two cultures", nowadays to be regarded as no more than an obsolete prejudice. The same praise is due to the Chairman of ICGG-18 and editor of these volumes that have been masterfully realized in the name of Leonardo da Vinci.

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