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EDITORIAL

Editorial on the special issue: Selected papers from the 2nd Joint Italian-Pakistani Workshop on Relativistic Astrophysics

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This is a special issue of the journal in which selected papers that were presented in the Second Joint Italian-Pakistani Workshop on Relativistic Astrophysics held in July 2009 at ICRANet, Pescara, Italy are published. This series of Workshops started in June 2007 with a meeting at the University of Salento, Lecce, Italy. It arose from a long time collaboration between the Department of Physics of the Salento University at Lecce, Italy and the Centre for Advanced Mathematics and Physics, National University of Sciences and Technology, Islamabad, Pakistan, which was formalized in 2006. The connection between the two Universities had begun due to two of us (FD and AQ) meeting in Rome, where the former was a student of the third (RR) and the latter was a guest of RR. As such, the first Workshop was dedicated to RR. The proceedings were published as a special issue of Nuovo Cimento B, volume 122, number 5, pages 465–616, (officially) in May 2007.

The second Workshop was dedicated to John Archibald Wheeler ("Johnny" to his friends and collaborators), who had died on April 13, 2008. The reasons for this

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dedication are that two of us (AQ and RR) had very close ties with John. The latter had worked with him as a Postdoctoral fellow at the Palmer Physics Lab at the University of Princeton, New Jersey, from 1967 to 1968 and had continued a very close association with him at Princeton till 1976, collaborating with him on the subject of black holes [1–3]. In 1978 RR recommended AQ for a postdoctoral visit to John, who had then just set up a Centre for Theoretical Physics at the Department of Physics at the University of Texas at Austin. Thanks to a Fulbright Hayes Fellowship AQ was able to visit John in 1978/79 and then with a Fulbright Fllowship again in 1986/87. This work tested the conjecture of Roger Penrose that the black hole singularity is simultaneous with the big crunch (in a closed universe) and demonstrated the result in the context of a density fluctuation in a Friedman model [4–6]. Later FD followed up a suggestion of Holz and Wheeler [7] (mentioned more a bit later) in a series of papers [8] (and references therein).

Of course, we are three out of countless many theoretical physicists who learned from Wheeler. He taught several generations General Relativity, bringing it from the realm of the esoteric and un-intelligible, to a matter of course science. He made the Mathematics that had been beyond the ambit of the physicist a usable tool. Not only did he teach generations while he was a teacher, not only did he continue to do so when he was no longer formally lecturing, he continues to do so through the book that is known as "the relativist's Bible" (or informally as "MTW"), *Gravitation* [9]. Of this book it was said that "it has three names on it and is written by one". While the other two had actually contributed substantially to what was written, the use of language and the mode of presentation is pure Wheeler. He became the doyen of relativists in the United States and all relativists looked to him for guidance and inspiration.

Wheeler had a passion for understanding how and why the Universe is as it is. His ambition was not to be known for his discoveries but to obtain an answer to the questions he had in mind, which would satisfy him. It was this passion, along with his deep physical insight that led many to ask for his views on all sorts of questions of Physics. He did not put ideas in different compartments, so that his religious beliefs were inextricably linked with his scientific/physical beliefs. His views of cosmology and of quantum theory led to his understanding of creation of the Universe by its observation by the intelligences at the end of the Universe, that would then be "the Creator". One may not agree with his views. It may turn out that the Universe does not have an end in the sense that he took. One may disagree with his interpretation of the quantum theory. Nevertheless, one cannot help admiring the grandeur and cohesion of his ideas.

John Wheeler did not try to "go around" a problem but wanted to "face it squarely". He believed that the deepest insights were obtained by confronting the problem at its worst, rather than trying to avoid the basic conflicts that arise. Instead of running away from problems he ran towards them. This is why he was able to concentrate on the big questions, which he ceaselessly tried to address.

To nearly the end of his long life Wheeler contributed to the development of new ideas in Physics in general, and Relativistic Astrophysics in particular. His last paper (published when he was 91) was written in collaboration with Holz [7] and provides a profound idea once again. While everybody knew that there could be large-angle deflections of light, Holz and Wheeler realized that this effect could, in principle, be

Fig. 1 An autographed picture of Einstein, Yukawa and a very young John Wheeler, here dedicated "To Remo Ruffini" on 5 April 70

used to cut across all controversies about alternate models for astrophysical black hole candidates and *show* that the holes are there. Light that is bent back on itself would give a "ring around the hole". It could even go twice around and form a smaller ring. These haloes outlining the black holes could be sought in the sky.

Wheeler had a way with words that made what he said stick in one's mind. From Wheeler one learned the importance of not only having something worth saying but of knowing how to say it in a way that brings out the worth in what is said. People may wonder what was so great about Wheeler coining the name *black hole* for an object of such intense gravity that light cannot escape from its pull. However, it is that name that has caught the public imagination and pulled many enthusiastic young minds into the study of these objects. When Wheeler talks of *magic without magic* the wonder and awe of science comes alive — it *is* magic without magic.

It was not only in finding the catchy, telling, self-explanatory, phrase that Wheeler was a past master. His *poor man's way* of understanding deep physical results has been the mainstay for many to test their ideas. It is not that Wheeler was non-rigorous. He had an excellent command of the mathematical tools that are used for theoretical physics. He could work his way through differential geometry or through complicated numerical calculations on a programmable hand-held TI calculator with equal facility. However, he would not trust the detailed calculation unless he could see it "the poor man's" way. As he said in "Johnny's first rule": "never do a computation without first knowing the answer".

It is almost unthinkable to write about Wheeler without mentioning his helpmeet, Janette, who made his visitors part of the family. She had provided him with the space and time to put however much he needed for his work and then provided a home for him to return to from his forays into the realm of Physics. Both AQ and RR carry

Fig. 2 Wheeler looking at photographs of Ruffini's young son, Iacopo

warm memories of Janette. For the former there was a significant contribution by her in helping his wife adjust to the demands on the time of AQ for research collaboration. She used to say "That is what it means to be the wife of a physicist". She advised that the wife of a physicist should have some activities outside the family so that she could give her husband the space needed for work. (The same would, presumably, apply for the husband of a physicist.) For RR there was a much longer contact and Johnny had autographed a photograph of his with Einstein and Yukawa to RR (Fig. 1). Another photograph (Fig. 2) shows Johnny looking at the photograph of RR's son, Iacopo.

Though Wheeler is no more, he infected many of us with his youthful enthusiasm, his way of thinking and his way of presenting ideas. We are all of us richer for having interacted with Wheeler.

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