

# **Glafka–2004 ‘Iconoclasm’: The Soul and Spirit of the Meeting<sup>1</sup>**

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The following is a brief talk that opened and attempted to set the atmosphere for the first ‘*Glafka–2004: Iconoclastic Approaches to Quantum Gravity*’ international theoretical physics conference. It aimed to capture the general spirit of the meeting, as well as to inspire and unite its participants under the following envisioned ‘cause’: to bring together and scrutinize certain important current quantum gravity research approaches in a fresh, unconventional, almost unorthodox, way.

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**KEY WORDS:** general relativity; quantum gravity; theoretical-mathematical physics research.

## **1. INTRODUCTION**

Dear participants, on behalf of Professor Anastasios Mallios, the Mathematics Department of the University of Athens, the European Commission (main sponsors) and Qualco (private partial sponsors), I wish to welcome you to Glafka—2004.

### **1.1. An ‘Iconoclast’ According to the Lexicon**

According to *Webster’s Encyclopedic Unabridged Dictionary of the English Language*, an ‘*iconoclast*’ (I kon a klast’, noun) is:

1. a breaker or destroyer of images, especially those set up for religious veneration, and/or

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2. one who attacks cherished beliefs, traditional institutions, *etc.*, as being based on error or superstition.

Historically, in Byzantium (723-843AC), ‘*iconoclasm*’ (*alias*, ‘*iconomachy*’) was the polemic movement against ‘*iconolatry*’—the worshipping of Christian icons (predominantly in churches).<sup>4</sup>

The three scientists from past times that immediately spring to mind as ‘scientific iconoclasts’ are Galileo Galilei, Charles Darwin and Albert Einstein. The latter revolutionized our ideas of space, time, matter, energy, and their dynamical intertransmutations. In view of some challenges presented by Quantum Gravity (QG), we may have to further revolutionize Einstein’s ideas and thus further ‘*dissect the iconoclast*.’

## 1.2. The Twilight of the Quantum Gravity Idol

What is ‘*the icon*’ in our case?: *Quantum Gravity* (QG)—arguably, the ‘Holy Grail’ of theoretical physics in the dawn of the new millennium. However, there is no quantum theory of gravity to begin with—anyway, not a conceptually sound, mathematically consistent and ‘*calculationally*’ finite one. In a nutshell, *there is no QG icon to destroy in the first place!* Hence, is our gathering here today ‘*futile*,’ actually ‘*begging the question*’ and, ultimately, ‘*begging the quest*’ for the icon?

Certainly, however, there is a plethora of views and approaches to QG, so that a ‘*mosaic*,’ ‘*patchwork*’ sort of picture of QG (with glaringly conflicting ideas at times!) has emerged over the last 30+ years of research, but there is no unanimous agreement on what QG is, or anyway, what it ought to be. By the way, theoretical physicists, unlike religious thinkers and preachers, are particularly bad when talking about ‘*teleological*’ and ‘*normative*’ aspects of their science, and that’s a good thing in my opinion, as it reflects that they are, in a Socratic sense, not sure/certain about their knowledge—they have no rigid convictions that they cannot readily revise or even shed. In scientific research, uncertainty about a subject is a virtue, not a blemish. It is sort of liberating not to know, for it invites a wandering imagination and a way of looking at the World afresh.<sup>5</sup>

## 2. ‘FIRST-ORDER’ ICONOCLASM

Thus in our case, ‘*iconoclasm*’—at least what I call here ‘*1st-order iconoclasm*’—pertains to challenging standard or well established conceptions

<sup>4</sup> In retrospect, I think I personally would have taken sides with the iconolatrés instead of the iconoclasts after having visited the beautiful Byzantine Period section of the Benaki National Heritage museum last night.

<sup>5</sup> See the prologue and epilogue in this author’s more technical contribution to this volume.

about and approaches to QG, as well as proposing alternative ones that are not ‘mainstream’ or ‘fashionable’ as it were.

The way I see it, the pentaptych of (not mutually independent) qualities of the ‘iconoclast’ in theoretical physics are the following (not in order of import or importance to her research endeavors and quests):

1. *Imagination* (contra knowledge; “*Imagination is more important than knowledge*” (Einstein)—the Glaflka motto<sup>6</sup>),
2. ‘*Riskability*’ (ie, able to take risks: ‘nothing ventured, nothing gained’—one of Chris Isham’s favourite sayings. Also Wolfgang Pauli: “*Only he who risks has a chance of succeeding*,”<sup>7</sup>)
3. *Obstinacy, perseverance* and ‘*pigheadedness*’ (“*what do you care what other people think?*”—Feynman),
4. ‘*Fearlessness*’ (especially with regard to making mistakes and putting one’s ideas to the theoretical test/criticism; Anastasios Mallios).
5. ‘*Authoritilessness*’ (question fairly well established ideas, concepts and practices—take nothing for granted, as a necessary given; see Einstein quotation below).

Feynman’s words about QG research below, taken from his Nobel Prize address, epitomize the second virtue of ‘iconoclasm’ I wanted to highlight for you today:

“... It is important that we don’t all follow the same fashion. We must increase the amount of variety and the only way to do this is to implore you few guys, to take a risk with your own lives so that you will never be heard of again, and go off to the wild blue yonder to see if you can figure it out ...”

Einstein’s words bring out the fifth virtue of ‘iconoclasm’ I wanted to highlight for you today:

“... Concepts which have proved useful for ordering things easily assume so great an authority over us, that we forget their terrestrial origin and accept them as unalterable facts. They then become labelled as ‘conceptual necessities’, ‘a priori situations’, etc. The road of scientific progress is frequently blocked for long periods by such errors. It is therefore not just an idle game to exercise our ability to analyze familiar concepts, and to demonstrate the conditions on which their justification and usefulness depend, and the way in which these developed, little by little ...”

While, about obstinacy, perseverance and stubbornly focusing on a goal, Einstein told once Ernst Strauss:

“I know quite certainly that I myself have no special talent. Curiosity, obsession, and dogged endurance combined with self-criticism, have brought me to my ideas. Especially strong thinking power I do not have, or only to a modest degree. Many have far more of this than I without producing anything surprising ...”

<sup>6</sup> See Glaflka poster.

<sup>7</sup> See also Richard Feynman’s quotation below.

In this respect, Ernst Straus also relates the following anecdote about Albert Einstein:

“We had finished the preparation of a paper and we were looking for a paper clip. After opening a lot of drawers we finally found one which turned out to be too badly bent for use. So we were looking for a tool to straighten it. Opening a lot more drawers we came on a box of unused paper clips, Einstein immediately starting to shape one of them into a tool to straighten the bent one. When I asked him what he was doing, he said: ‘*When I am set on a goal, it becomes very difficult to deflect me*’.”

At the same time, I think it is important that the iconoclast does not forget that she is *standing on the shoulders of giants* (Newton); albeit, at the same time standing on her own two feet . . . which brings me to what I think of as the ‘*2nd-order iconoclasm*.’

### 3. ‘2ND-ORDER’ ICONOCLASM

Iconoclasts gather together to tear down each other’s icons—their theories and general ‘*Weltaufbau und Weltanschauung*’, like we have gathered here today. Of course, the idea is to pick up each other’s pieces and synthesize *the* QG icon.

*Iconoclasts should not just be ‘pure deconstructionists.’*

One feels that we ought to find common grounds—as it were, a common denominator—in our apparently diverse, but supposedly fundamental and unifying, conceptions of Nature. We should all have faith in the unity of Physis—after all, we refer to the World as a *Cosmos/Κόσμος*, not a *Chaos/Χάος*—but we should also respect and appreciate each other’s differences. As John Archibald Wheeler said: “*More is different*.” We should search for unity in Nature’s cherished diversity<sup>8</sup>. . . which brings me to the most radical iconoclasm of the ‘3rd kind.’

### 4. ‘THIRD-ORDER’ ICONOCLASM

Here is the paradoxical question:<sup>9</sup>

*Who cuts the QG iconoclast?*<sup>10</sup>

Of course, it is important that my gross *idealization* of the 1st and 2nd-order QG iconoclast above—especially in view of a not ‘well defined,’ let alone unanimously agreed on, project for a QG theory-construction—does not turn into an *idolization*; for ideally,

<sup>8</sup> Again, see the prologue and epilogue in this author’s more technical contribution to this volume.

<sup>9</sup> In analogy to the logical oxymoron: ‘*Who shaves the barber?*’

<sup>10</sup> In Greek, an ‘*iconoclast*’ (‘*εικονοκλάστης*’) is (s)he who ‘*cuts icons*’ (‘*κλάζει εικόνες*’).

*a genuine iconoclast should tear down all idols, including (and especially!) his own.*

Thus, to pay my respects to the possibility that *we might be chasing a QG chimera after all*, here is a telling quotation of David Finkelstein—from an early (:May 1993) pre-print version of his 1996 book *Quantum Relativity: A Synthesis of the Ideas of Einstein and Heisenberg*’ (Springer-Verlag, 1996)—capturing what I coin the (most ‘radical’) ‘3rd-order’ iconoclasm of the elusive QG theory *itself*:

### The Saviors of Physical Law<sup>11</sup>

*“... What are we after as physicists? Once I would have said, the laws of nature; then, the law of nature. Now I wonder.”*<sup>12</sup>

A law, or to speak more comprehensively, a theory, in the ordinary sense of the word, even a quantum theory of the kind studied today by almost all quantum physicists, is itself not a quantum object. We are supposed to be able to know the theory completely, even if it is a theory about quanta. Its symbols and rules of inference are supposed to be essentially non-quantum. For example, ordinary quantum theory assumes that we can know the form of the equations obeyed by quantum variables exactly, even though we cannot know all the variables exactly. This is considered consistent with the indeterminacies of quantum theory, because the theory itself is assumed to sum up conclusions from arbitrarily many experiments.

Nevertheless, since we expect that all is quantum, we cannot consistently expect such a theory to exist except as an approximation to a more quantum conception of a theory. At present we have non-quantum theories of quantum entities. Ultimately the theory too must reveal its variable nature. For example, the notion that an experiment can be repeated infinitely often is as implausible as the notion that it can be done infinitely quickly ( $c = \infty$ ), or infinitely gently ( $\hbar = 0$ ).

It is common to include in the Hamiltonian of (say) an electron a magnetic field that is treated as a non-quantum constant, expressing the action of electric currents in a coil that is not part of the endosystem but the exosystem. Such fields are called external fields. Upon closer inspection, it is understood, the external field resolves into a host of couplings between the original electron and those in the coil system, now part of the endosystem.

*It seems likely that the entire Hamiltonian ultimately has the same status that we already give the external field. No element of it can resist resolution into further quantum variables. In pre-quantum physics the ideal of a final theory is closely connected with that of a final observer, who sees everything and does nothing. The ideal of a final theory seems absurd in a theory that has no final observer. When we renounce the ideal of a theory as a non-quantum object, what remains is a theory that is itself a quantum object. Indeed, from an experimental point of view, the usual equations that define a theory have no meaning by themselves, but only as information-storing elements of a larger*

<sup>11</sup> This, in a metaphorical sense, ‘post-anticipates’ Nikos Kazantzakis’ ‘*Salvatores Dei*,’ excerpts of which we shall encounter in the sequel.

<sup>12</sup> Our emphasis.

*system of users, as much part of the human race as our chromosomes, but responding more quickly to the environment. The fully quantum theory lies somewhere within the theorizing activity of the human race itself, or the subspecies of physicists, regarded as a quantum system. If this is indeed a quantum entity, then the goal of knowing it completely is a Cartesian fantasy, and at a certain stage in our development we will cease to be law-seekers and become law-makers.*

*It is not clear what happens to the concept of a correct theory when we abandon the notion that it is a faithful picture of nature. Presumably, just as the theory is an aspect of our collective life, its truth is an aspect of the quality of our life<sup>13</sup> . . .”*

The ‘law-making,’ as opposed to the (merely) ‘law-seeking’, imperative (of what is here coined ‘3rd-order iconoclasm’) in the Finkelstein quotation above recalls Nikos Kazantzakis’ concluding words—as it were, the distillation and résumé of his spiritual credo—in his ‘swan-song’ of a book ‘*Salvatores Dei (The Saviours of God): Spiritual Exercises*’:<sup>14</sup>

“. . . 1. Blessed be all those who hear and rush to free you, Lord, and who say: ‘*Only You and I exist.*’  
 2. Blessed too be all those who free you and become united with you, Lord, and who say: ‘*You and I are One.*’  
 3. And thrice blessed be those who bear on their shoulders and do not buckle under this great, sublime, and terrifying secret: ‘*That even this One does not exist*’ . . .”

And with these ‘agnostic’ (but not necessarily pessimistic!) and ‘mystical’ remarks, I wish you all wholeheartedly:

Enjoy a mystifying Glafka!

## 5. HEGELIAN POSTSCRIPT: THE OWL OF MINERVA

And when you thought it was all over, I would like to close this opening talk with a ‘*post-anticipation*’ of the deeper significance of Glafka, inspired by a recent e-mail exchange with Rafael Sorkin.

First, I would like to quote Peter Singer—the famous ‘bioethicist’, from his Princeton homepage:<sup>15</sup>

“. . . Minerva, the Roman goddess of wisdom, was the equivalent of the Greek goddess Athena.<sup>16</sup> She was associated with the owl, traditionally regarded as wise, and hence a metaphor for *philosophy*. Hegel wrote, in the preface to his *Philosophy of Right*: ‘*The owl of Minerva spreads its wings only with the falling of the dusk*’. He meant that philosophy understands reality only after the event. It cannot prescribe how the world ought to be . . .”

<sup>13</sup> Again, our emphasis throughout.

<sup>14</sup> Translated by Kimon Friar (a Touchstone Book, Simon & Schuster Publishers, 1960).

<sup>15</sup> <http://www.petersingerlinks.com/minerva.htm>

<sup>16</sup> The patron goddess of Athens.

Rafael shared with me Balachandran’s (:his celebrated colleague-physicist at Syracuse University) interpretation of Hegel’s owl (which I personally prefer to Singer’s strictly ‘*after-the-fact*’ one), according to which:

“... Minerva’s owl is spreading its wings at dusk (or something to that effect), the meaning reputedly being that only when an event or development is near its end does its significance become clear . . . ”

Regarding our Glafka gathering here, it’s good that there’s still another 3 days, plus 10 h or so, till dusk falls on the last day of the meeting . . .