

Is this Ethical?

C. K. Raju
c_k_raj@vsnl.net

M. Walker's letter (*Notices*, April 2007), concerning the article by Johnson and Walker, "Sir Michael Atiyah's Einstein Lecture..." (*Notices*, June-July 2006), and drawing attention to my past work, is a step in the right direction, but the whole truth needs to emerge.

In two lectures given in October 2005, Atiyah acknowledged no prior work, claiming credit for connecting retarded differential equations to quantum mechanics. This was called "Atiyah's hypothesis", and hailed as a potential paradigm shift in the Johnson-Walker article. Consequently, it came to be discussed as "Atiyah's new basis for quantum mechanics" (e.g. <http://physicsforums.com/archive/index.php/t-96806.html>). Thus, the fact is that my prior work *was* suppressed.

Atiyah certainly knew of my prior work at the latest by 26 Oct 2005, when my 2004 paper and a reference to my 1994 book were mailed to him, and he acknowledged reading them, and accepted the similarity. This was well before the Johnson-Walker article (shown to Atiyah before submission), which still did not refer to my work. Atiyah (personal communication) justified this on the grounds that he does not regard the *Notices* article as a "serious" publication. Thus, at least in the case of the *Notices* article, suppression of my past work was deliberate.

The ethical guidelines of the AMS (*Notices*, June-July 2006) aim to ensure appropriate allocation of credits. That could have been achieved, even without citing references, by clarifying that Atiyah was not presenting original work. Such a clarification would have been especially appropriate considering that Atiyah's talks were widely publicised, and the wide readership of the *Notices* which has traditionally served to establish priority. Atiyah, however, stated to the contrary "don't forget I suggested it" (also quoted in the *Notices* article). This is an unmistakable claim of priority—especially given the deliberate suppression of my prior work. Is this ethical?

Secondly, Atiyah (personal communication) has claimed to have independently rediscovered my idea. Is *this* claim ethical (regardless of its validity)? Thus, the AMS ethical guidelines explicitly state that “a claim of independence may not be based on ignorance of widely disseminated results”—for such ignorance can so easily be feigned. And, my work was undoubtedly published and widely disseminated earlier, through books, articles, conferences, website, and newspaper reports. (Further details of this are at http://www.11picsoftime.com/Atiyah_annexes.pdf.) Thus, Atiyah’s claim of “independent rediscovery” is unethical according to those guidelines. This is particularly unfortunate since Atiyah has added nothing new by restating as a conjecture what I had earlier claimed as a theorem; this has only obscured important aspects of my theory, such as the connection of the structured-time interpretation of quantum mechanics to quantum computing.

Thirdly, is Atiyah’s claim of independent rediscovery valid? Given the long list of claims of “independent rediscovery” of revolutionary ideas, since Copernicus, various criteria to test the veracity of such claims have been proposed in my forthcoming book *Cultural Foundations of Mathematics: The Nature of Mathematical Proof and the Transmission of the Calculus from India to Europe in the 16th c. CE* (PHISPC vol. X, part 4, Pearson Education, in press).

One such criterion is a commonsense “epistemic test”: if two students turn in very similar answers, one way to ascertain whether copying has taken place is to test the students’ understanding. One cannot thus directly interrogate the past—but mistakes may expose lack of understanding. Does Atiyah’s claim of “independent rediscovery” pass the epistemic test?

There is a conceptual error on a subtle point in (a) Atiyah’s video-recorded Einstein lecture of 21 October 2005, (b) his webcast talk of 24 October 2005 at the Kavli Institute of Theoretical Physics, and (c) the *Notices* article (approved by Atiyah). For example, the *Notices* article states “all physical models. . . have assumed one basic premise—that we can *predict the future from full knowledge of the present*. Atiyah suggested an alternative to this paradigm: Perhaps we need full knowledge of the present *and the past* in order to predict the future.” [Emphasis original] This is incorrect: as any physicist will understand, past information is already contained in the field. Since field and particle pictures are equivalent, functional differential equations *do* arise in *classical* physics if one uses only the particle picture. The functional differential equations I solved in my 2004 paper (*Found. Phys.* 34, 937–62) were those of *classical* physics, although I explicitly needed to

prescribe a past history for their solution.

The physics has been available since Heaviside and Lorentz—but the relevant functional differential equations were simply not earlier solved in any significant physical context by physicists. That is, my proposal is not a new physical hypothesis but a correct (though novel) mathematical understanding of long-existing physics: a thesis not a hypothesis. If functional differential equations were applied, say, to finance (as I have suggested) that would be a new hypothesis; but in physics itself no new hypothesis is needed.

There *are* many surprises here—for example, the solution of the correctly formulated electrodynamic 2-body problem shows that the classical hydrogen atom is not necessarily unstable, contrary to what has been believed for a century. However, the paradigm that is overturned is only the “Newtonian paradigm”—a term carefully defined by me in my 1994 book, *Time: Towards a Consistent Theory* (p. 118), and *not* equivalent to classical physics with which it can easily be confounded, as Atiyah has done.

It is clear from his videotaped lectures and the above quote that Atiyah has somehow failed to comprehend that functional differential equations already arise in existing physics. The very terminology of “Atiyah’s hypothesis”, apart from being historically objectionable, is conceptually inaccurate—for no fresh hypothesis is needed. Atiyah’s error on this point was no slip, for this point about fields did not register with him, even though (a) it was forcefully raised by David Gross during Atiyah’s talk at the Kavli Institute (see the streaming video of Atiyah’s talk at <http://online.kitp.ucsb.edu/online/strings05/atiyah/>), and was (b) subsequently reiterated in the email of 26 October 2005, sent by my son to Atiyah. Further, (c) Atiyah persisted in this error while approving the *Notices* article. An error repeated thrice shows lack of understanding. As a Fields medallist, Atiyah is highly regarded, but he has erred in understanding the mathematics of the field.

On the epistemic test, this error of understanding points also to a further ethical error, in addition to those already mentioned. Mere belated acknowledgement of the undeniable fact of my past work is inadequate to undo all this, especially since Atiyah has not expressed any remorse so far, for any ethical error. It is now for the mathematics community at large either to recognize this as an ethical error and censure it, or else to encourage others to emulate the example set by Atiyah, and avoid acknowledging past work, until pressed to do so. The only third possibility I can see is to explicitly adopt double standards.