Re: use of real numbers in mathematics and physics

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On 12/9/2004 6:33 PM, frisbieinstein@yahoo.com wrote:
> robert j. kolker wrote:
>> Tobias Fritz wrote:
>> >
>> > 2) Do you think that the real numbers are the appropriate system
>> > for formulating a unified physical theory? What about quantization of
>> > spacetime?
>> >
>> My guess is that a purely discrete theory to describe physical
>> reality will be mathematically intractable. We have a dillema. The
>> mathematics we can use, cannot be literally true of reality. The mathematics that
>> can be literally true of reality we cannot use because of its difficulty.
>
> In my opinion real numbers and other infinities are all useful
> approximations. They are used because they are much more convenient
> and there is no reason to believe that the difference is significant.

I agree. Both the potentially infinitly large and the potentially infinitely small, constituting the ideal unresolvable continuum, are necessary requisites of a mathematics that optimally fits to all branches of physics. Hilbert was a little bit mislead by the limitation towards the infinitely small set by quantum physics when he in 1925 commented on "Das Unendliche". Mathematicians should accept that Hermann Weyl was perhaps correct with his somewhat constructivistic 'sauce', and there is no reason at all to replace the continuum by means of discrete numbers. Spectra of discrete functions are anyway continuous and vice versa. Meanwhile, I learned that there are already less brutal and more appealing concepts than the usual set theory. In particular, I appreciate the constructivistic term apartness, slightly deviating from equality.

What about the structure of spacetime, I still tend to not prematurely exclude the possibility that time might not relate to the observed events according to the traditional notion of time but to the observer who is experiencing it.