



John Baez <johnb@ucr.edu>

Jugendtraum

3 messages

John Baez <john.baez@ucr.edu>

Wed, Jul 13, 2022 at 11:36 AM

Reply-To: baez@math.ucr.edu

To: JAMES DOLAN <james.dolan1@students.mq.edu.au>

Hi -

Btw, as I put up old videos I keep realizing I never got the full point of what you were trying to say in some of our sessions... perhaps because you never quite got to it. For example in the session about the 20th cyclotomic field you spent a lot of time working out its lattice of subfields, and then you said you were going to come up with abelian varieties from some of these, and I think you described the one you're talking about here:

so i'm still unsure about the endomorphism ring and neron-severi group and so forth of the abelian surface obtained from the 5th cyclotomic field. at the moment i suspect that the endomorphism ring is probably a rank 8 free abelian group, which seems like it should make the neron-severi group rank 4

But then you said some stuff about the Jugendtraum, and generalizing the Jugendtraum, and I basically didn't understand that at all.

I think the same sort of lack of understanding came in where you were talking about Heegner numbers.

I don't get what you think a good statement of the non-generalized Jugendtraum would be, or how it's related to torsion points on elliptic curves - maybe in a way that makes it sound really similar to Kronecker-Weber?

Best,
jb

JAMES DOLAN <james.dolan1@students.mq.edu.au>

Wed, Jul 13, 2022 at 3:24 PM

To: John Baez <baez@math.ucr.edu>

yes, you're homing in fairly precisely on some specific points where i haven't done at all a good job so far of getting my points across!

i really want to try to say some of those things much better, and try very soon; particularly in those cases where i feel i do really understand a significant part of the picture of course there's ambiguity between trouble explaining things vs trouble understanding things, and sometimes you (meaning me) learn, from trying to explain something, that you didn't understand it as well as you thought you did

anyway to the extent that you want to include any commentary on the videos you're putting up it might be an interesting possibility to include some of these "what the hell was that about?" reactions that you're describing

you: "I don't get what you think a good statement of the non-generalized Jugendtraum would be, or how it's related to torsion points on elliptic curves - maybe in a way that makes it sound really similar to Kronecker-Weber?"

that's part of it but there's more a (seemingly) extremely clear idea in my mind but i'm still struggling to put it into words, perhaps partly because of the way it in part involves pictures

it should have a hell of a lot to do with the motivic ideas we've been trying to learn

there's also interesting issues about the extent to which we should want to make kronecker-weber not just an analog of certain jugendtraum ideas but moreover a (presumably somewhat degenerate) special case

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JAMES DOLAN <james.dolan1@students.mq.edu.au>

Thu, Jul 14, 2022 at 12:46 PM

To: John Baez <baez@math.ucr.edu>

you: "I think the same sort of lack of understanding came in where you were talking about Heegner numbers."

by the way in connection with this stuff we should get very interested at some point soon in the jacobian variety of the klein quartic, as acted on by the automorphism group of course we have prohibitively many things we should get interested in, but i think this one might serve as a useful jumping-off point for pursuing further big ideas

this is possibly discussed in that interesting book with the silly title "the 8-fold way" and hopefully connecting with elliptic curves with complex multiplication by the kleinian integers

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On Wed, Jul 13, 2022 at 2:36 PM John Baez <john.baez@ucr.edu> wrote:

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