**#52S**
**Lila Recordings**
**Set 2: 10-11-06 to 12-11-06**
**061112000**
**58 min**
Recording 52

B: Hey, I didn't expect it. (Everyone laughs.) I just hoped for the degree to be…I was happy when I discovered, "Hey, the degree is close," you know.

Y: But now I ask the question, "Why two?" The same question comes up.

B: Ah, "Why two?"

Y: I took the measurement and I multiplied by two. (Biljana acknowledges.) And that's how we got this.

B: Aha. The measurement here you…

Y: The measurement is in this. And then I multiplied this by two. Why two? It's the same question as Michael was asking.

B: The measurement. This measurement…

Y: I'll give you the measurement. The measurement is: one one point seven three four four four one zero five times ten to the minus fifteen. **[Recording time 00:52]**

B: Multiplied by two?

Y: By two and you get the number I just gave you. (Biljana acknowledges.)

B: Why two? Now we could…think about it.

So, when I saw… Now, this morning when I have seen this first recursion, I thought… (Interrupted by Punita taking a picture of Biljana and Yogeshwar working)

Y: So this is equal to (Biljana acknowledges.) the number – where do you have it?

B: Here

Y: Yes. That number.

B: Two point three four. I couldn't believe it's correct in three digits.

Y: Yes.

B: Two point three four. My telephone is ringing.

Y: Yes.

B: Shall I go? (Y acknowledges.)

Y: Morning.

Punita: Morning. Well, that's exciting.

Y: Yes. We just discovered it.

Punita: Yes. Yes, I know… When Bret was talking the other day and talking about the numerology – you know, "you can make anything match anything" …This…I mean, I don't see this…

Y: That's not numerology.

Punita: I don't see it like that. (Laughter)

Y: That's mathematical.

Punita: Yes. You know, I just thought, "Hmmmm." Anyway, I just…for your edification… just…if… We were talking about it yesterday and this is some background information.

Y: Very good.

Punita: And it shows a relationship to the Golden Mean and all that.

Y: Yes. There it is.

Punita: I can print out a copy for you too, if you find that useful. (Biljana acknowledges.) And there are some other documents here that you can look at. If you find those useful I'll print them out for you. I just didn't know if I had done those already.

Y: No, not these. (P acknowledges.) I had one from fifteen years ago. (P acknowledges.) But every five years they come out with a summary edition of the physical review.

Punita: OK. So you can take a look at those, Biljana. If you find them useful (Biljana acknowledges.) at lunch I'll...

B: Pity I do not have access to the internet because the time is so short after the afternoon session. Otherwise, I could check many things. So, this is after the first recursion? Muon.

Y: The first recursion was the… Yes. On the second recursion, this is the result of.

B: This is the second recursion. And now, this morning when I was browsing through Baker's article – to find the exact formula – I have seen actually, yes, the recursions are… **[Recording time 4:32]** So this is muon, OK.

Y: That's the muon. Whereas, what he did was electron. (B acknowledges.) And he used the Compton wavelength (B acknowledges.) of the electron to calculate the value of N (B acknowledges.) which comes out exactly the value of 10 to the e to the pi. (P laughs.)

B: Yes, which is tremendous.

Y: Well, is it numerology, or is it mathematics and science? (B & P laugh.) (B & P talk in background.) So what you did was just do the same thing as Michael did; but you did it for two.

B: Two crossovers.

Y: Two crossovers.

B: Or two crossovers and two circles, **[Recording time 5:34]** two circuits and four comparisons…

Y: Aha.

B: We should go through the whole thing if you think so.

Y: I think so.

B: Because now we could go to the second…to another particle. Once we have…
**[Recording time 5:54]**

Y: We could go to the tau particle.

B: To the tau particle. Just too…exactly to see what it is…

Y: That would be probably non-comparisons. **[Recording time 6:02]**

B: Huh? Ah, yes. OK, OK. I now have the procedure. (P&Y laugh.) It could be simplified now once. And now most important, to see that it is correct result; you know? One **[Recording time 6:20]**, correct result, correct measure. Measure the result is 2.34688882 times 10 to the minus 14 meters which is three digits correct.

Punita: That's just wonderful, Biljana.

B: I have neglected one member. I'll show you. And if I don't neglect it, it will be even more…

Y: You're standing there with a knife in your hand, Darshana. (Everyone laughs.)

Darshana: And it's sharp. (Laughs)

Punita: We can talk it out.

Darshana: I just sharpened that. Feel that.

Punita: I believe you. We can talk it out, Darshana. (Laughs)

Darshana: Maybe we can see if it works. (Laughter)

Punita: Well, that's really exciting, Biljana. I just… That's just amazing!

B: I wanted to do something in particles (P acknowledges.) because in matrices, I know I could do it. But it was a challenge for me to do it in this field of particles. (Long silence)

Punita: So this was tau particle?

Y: This one? Muon.

B: Muon.

Punita: This was muon.

Darshana: I'd like to have a better look at that later.

Y: Yes. Take it with you.

Darshana: I don't know if it is the sort of thing… **[Recording time 8:10]** (Y acknowledges.) I did a quick…I did a redo of this and I'll hand that to you later. (B acknowledges.) I just want to talk to you about it because I didn't get any pictures. **[Recording time 8:24]** If you would just talk to me about it, (B acknowledges.) because I didn't get recorded what you were saying yesterday. He didn't take any pictures, also. (B acknowledges.) So the words aren't that useful without the pictures. So if we could just go over it and you could tell me just a few basic things that might help you…

B: Yes, yes. To proceed.

Y: OK.

Darshana: I discovered two or three things which I had forgotten. So it's all clear to me again. (B acknowledges.)

B: Ahh. OK. We shall do it. (D acknowledges.)

Y: So we'll go over this at least in the essence of what you're doing. (B acknowledges.) I don't have to learn all the mathematics. But I have to know what it is. (B acknowledges.)

B: I want to show you these two ways because this is what confirmed…it was confirmation for me that I am at least doing the procedure right.

Y: This is the time per beat?

B: Now the approach is also proven to be good. I mean… This is time per beat. Shall we start?

Y: Yes.

B: So, this is muon. (Y acknowledges.) Now?

Y: You put a Mu sign. Yes.

B: So we have two crossovers. And now the assumption is that for the first crossover, we have elementary structures of a fork with two. For instance, this is the picture. We have a circuit. We have referent Individual *here;* and we have a bifurcated structure of two. So it is all together three arrows including the one for the circuit. This is the smaller circuit, so to say. And the larger circuit is over the structures for the second crossover. **[Recording time 10:50]** For the second crossover, this is a structure like this one. This is the Individual A and now I have a fork structure of three which is F of four. So we have, actually, F of four. So we have three circuits, actually, although it is on a sphere. So, the two of them might be even the same. But since F of four is smaller than F of three, we suppose roughly that it is bigger.

Y: They're calling you again.

B: Shall I check…

Y: You want to go? You go.

B: OK. Thank you.

Punita: I find it interesting that F3 and F4 would have calculations just for the pattern, independent of the circuit, show up meaningfully embedded in the circuit here, for this calculation.

Y: Oh, yes. That's the embeddedness that there's the circuit, on the one hand, which is isolatable; and then you can isolate the F3 and the F4 and then merge them. (P acknowledges.) And that's what she's doing.

B: And now, for one beat we have, for instance… now I do two comparisons here: the largest circuit, which is of 2N, with the medium circuit, which is N minus F of four. I consider it to be larger because F of four is smaller, as expected number of four arrows.

Y: Now, Michael used F3, right? On the electron.

B: Yes. And then I do another comparison of the medium circuit to the smallest circuit**.** **[Recording time 13:00]** Or…which is all the same – the largest circuit with the smallest circuit. And it is 2XN. I suppose that for one beat… For instance, X circles will be done through the biggest circuit, then X plus one through the medium circuit, and X plus K… because I don't know. I couldn't suppose it is X plus 2 for the second harmonic. We don't know if the number will fit. But I introduced another unknown which is K. So X plus K is the number of circuits around the smallest circuit which has circumference of N minus F of three.

Y: So this is a different K…

Punita: Yes. I understand.

B: Yes, this is different.

Y: …than the average number of crossovers for an Individual.

B: Yes, yes. This is the number… X plus K altogether is the number for the circlings made over the smallest circuit. I was thinking a lot of it. I was doing different combinations. But finally I discovered this one should be right because otherwise, somehow, we could not even solve the equation if I introduced another 3rd, for instance. So we have two comparisons here. And it is a good…it is beautiful that they both lead to same results. I have checked the one and the second one. Actually, we have two equations of two unknowns. So out of the first one we have 2XN which is…for one beat, we have so many circling around the largest circuit it's equal to the circuits done around the medium circuit is 2X plus one, and the circumference is N minus F of four**.** So 2 and 2 [**Recording time 15:22**] is eliminated which is XN, is XN plus N minus… the rest is X plus one F of four. Then we have…if I put this on their left side – the second member – we have X plus one F of four equals N. So X plus one is N over F of four, X is N over F of four minus one over N minus F of four over F of four. So we have N. So we have expressed X from the first equation and now we replace the value of X in the second equation. And the second equation is equivalizing the number of circuits made over per one beat over the larger circuit with the number of circuits, circlings, made over the smallest circuit. So we have 2XN is 2X plus K N minus F of three now because this is the smallest circuit. And we have 2 and 2 are eliminated. XN is XN plus KN minus X plus K F of three. XN and XN is eliminated; KN is this member on the left side, gives X plus K F of three. Then KN minus this member, K F of three of the left side is X F of three. And KN minus F of three is XF of three. K is XF of three over N minus F of three which gives for K, N minus F of four over F of four; this whole member multiplied by F of three over N minus F of three. Or K is N minus F of four multiplied by F of three over – and the denominator we have F of four multiplied by N minus F of three. So, K is N minus F of four over N minus F of three, multiplied by F of three over F of four; which is very element. (P acknowledges.) And this is N minus F of four over N minus F of three. And now, if I find F of three over F of four, it is: F of three is third square of six N squared, third root, over F of four, which is fourth root of 24N to the third degree. This is six over 24; in the upper we have N to the degree of 2/3rds over N to the degree of 3/4ths, which is 1/4thN to the degree of 2/3rds minus 3/4ths which is one over four N to the degree of eight minus nine over 12, which is 1/4th N to the degree of minus 1/12th. And now I consider this to be not relevant, taking into account the value of N which is…

Y: What was this?

B: Ten to the twenty…

Y: You said, "You considered this…"

B: To be… It is possible to be neglected. (Y acknowledges.) I considered it to be not relevant for the final result. And also this gives us K to be approximately one because if we take into account the value of N, which is very large – **[Recording time 19:40]** it is 10 to the degree of 23 minus this F of four over and F of three are very small numbers. So K is approximately one. So this is… Actually, when I mentioned to you one day before that I look at this as if they are on a sphere and then we have one crossover from the one side, for instance, and the other crossover from the other side and they are approximately the same, actually – taking into account the numbers. And it proves to be so. Because, although I have done an assumption that there is a difference, and I have taken into account, I introduced a smaller circuit and a larger circuit. (Y acknowledges). And for the smaller circuit I take F of three, which is justified because F of three is bigger than F of four; and for the medium circuit to be N minus F of four. And to have X plus K circling. But it proves that K is one, which is the same as this one. X plus K X plus one is X plus K. So it proves that these are actually slightly…they are very close, one to another. (Y acknowledges.) Depends on how accurate we want the result to be. And so, later on…

And now I take the second equation, which arises from the equalizing the circling over the largest circuit and the smallest one. And this I do for a reason. To be different that…to show if this thinking is OK, actually; to introduce something new in the picture. And if I do it time per one beat is from the smallest circuit, it is **[Recording time 22:30]** 2X plus K N minus F of three time quanta; where time quanta is Planck time over square of 2N. And if we replace…we have 2, X is N minus F of four over F of four plus K; K is N minus F of four over N minus F of three, multiplied by F of three over F of four; this whole member is X plus K, and this is multiplied by the circumference of the circuit, which is N minus F of three. And all of this is the number of surroundings being made, the circlings around the smallest circuit per one beat, which is Planck time. All this is divided by t-quanta…by time quanta. And now this is two – in the denominator we have: F4 multiplied by N minus F of three; we have also F of three, F of four here. And on the numerator we have N minus F of four – because F of four is here – N minus F of four multiplied by N minus F of three, which is from the denominator, plus N minus F of four. And here, what is missing here is…we have the whole N minus F of three multiplied by F of four is in the denominator, so we just copy the member in the numerator – N minus F of four multiplied by F of three. And this whole thing is multiplied by N minus F of three. If we eliminate **[Recording time 24:42]** (Yogeshwar comments.) N minus F of three and F of three tq, we got two over F of four multiplied by N minus F of four, multiplied by N minus F of three plus N minus F of four, multiplied by F of three t-quanta; and this all per beat. This is two over F of four, multiplied by N minus F of four, multiplied by N minus F of three, plus F of three; because we have taken this member out. And the rest is: N minus F of four plus F of three t-quanta. And this gives us…for the number of tq's per beat, two over F of four, multiplied by N minus F of four N. Which is all the same as if I have taken the simpler root, the simpler way to do it because it is all the same since I'm equalizing the circuits – the largest with the medium and the largest with the smaller – it was all the same which one I'll take. But I have taken on purpose the more difficult to do one, the one that is more difficult to do, in order to check if the whole procedure is done correctly. And, yes, it is done because we could see that this is all the same as we have taken the one beat per the largest circuit, which is 2XN. And since X we have found out to be N minus F of four over F of four, 2XN is 2 N minus F of four over F of four N. Which is just the same with the result we got by equalizing the largest circuit with the smallest one. So this is like a prove that at least all the procedure is done correctly. So time per one beat is: 2N minus F of four over F of four N t-quanta. So, in two different ways, the same result is being obtained. So it should be correct. (Y acknowledges.) And now, time per one beat is – so 2 N minus F of four over F of four times N t-quanta…elementary time unit is Planck time over square of 2N.

Y: So now what are you doing? The time per the beat? You just…

B: Now I have the time per beat expressed in… through N because all this F of four is expressed through N. It is fourth root of 24N to the third. (Y acknowledges.) And so, all of them are expressed through N. And actually we have the frequency because the frequency is the reciprocal value of this one.

Y: This is one beat in this much time; OK.

B: Yes, yes. And then the frequency is the reciprocal value. (Y acknowledges.) The frequency is F of four over 2N minus F of four N t-quanta. And so t-quanta is…reciprocal value of t-quanta is square of 2N Planck time to the degree of minus one.

Y: So now you're converting it to wavelength.

B: And now we are converting, yes, into wavelength. The wavelength lambda times the frequency F is *c*.

Y: Yes. Is the speed of light?

B: Where *c* is the speed of light. And it is one Planck length over one Planck time. So lambda is *c* over F and this is one over F *lp*, Planck length. So, once again we have the reciprocal value which is the initial one. So lambda is the one over F which is actually the hour units per one beat but now expressed in terms of…

Y: Planck length.

B: …Planck length; now in length. And we have, once again, 2N minus F of four over F of four, N over square of 2N – N is from the time per one beat – and we had one over square of 2N…this was taken from the value of elementary time unit. And this is all expressed in Planck length. (Y acknowledges.) And now, we neglect here the second member because it is very small. Because here we have 2 – once we multiply this for the first member we have 2N squared over F of four, which is fourth root of 24N to the 3rd multiplied by square of 2N, all expressed in Planck length. And this N squared is actually 10 to the 46th, which is…

Y: very large.

B: …very large. And this second member…if we include it maybe we shall even…

Y: refine it.

B: …refine the result. But this is excluded since it is very…it is very small. **[Recording time 31:04]** We have 40 degree of 24. And I have found here that, for instance, F of three over F of four is 1/4th N to the degree of minus one over 12. (Laughs) And now it's 46 minus one over 12 is really something in the 30th decimal digit. (Y acknowledges.) So the difference really could be neglected. So this remains and now we replace here 2 – we have N…from the numerator we have 2; from here we have minus half; and from here we have, since we have here N to the 3rd degree, from here we have 3/4th (this is the overall degree of N). And the rest is 2 over square of 2 N **[Recording time 32:26]** for degree of 24. And then for Mathematica; I have all the variation here, in Mathematica, done.

Here are all the variations. (Y acknowledges.) And we have here, lambda is 1.41421 over 2.21336 – here, somewhere, we have all this – multiplied by N to the 3/4ths. Aha. Here we have…this was done in Mathematica. N which is numeral 24 to the degree of N to 1/4th is 2.21336. This is this result, and so on. And then I proceed finding all these numbers. This is our N (Y and B laugh.) with 10…15 digits (Y acknowledges.) to the 10 to the 23. It is also taken from Mathematica (Y acknowledges.) to the degree of 3/4ths and finally lambda – muon, it should be – is 1.44878 times 10 to the 17th, Planck length. And now for the Planck length – and we could find another better result for Planck length – is **[Recording time 34:26]** 1.61605 times 10 to the minus 33. If I replace this, I got this one: 2.34119 times 10 to the minus 16 centimeters; because this Planck length was given in centimeters. And if I find it in meters, it is 2.34119 times 10 to the minus 14 centimeters.

Y: What is this?

B: Planck length.

Y: Planck length; yes.

B: Plank length. And finally…

Y: These figures are in question. And I've been able to calculate them directly using alpha. So I did it to 11 places. (B acknowledges.) But this is because the gravitational constant is involved in calculating this value. And Big G is only known, actually, to three places. That's the agreement of all the five different methods of measuring it. (B acknowledges.) So, anything past three places is in the literature subject to error. (B acknowledges.) OK.

B: And finally, we have found this morning that the actual value for muon which is actually the particle in question because it is crossover after recursion…

Y: Yes, but we have the same factor: 'Why 2?' **[Recording time 36:02]** Go back.

B: Now, I see. It's 'Why 2?'

Y: Go back. (B turns pages.) Yes. You see, in this equation you have 2. (B acknowledges.) And he had 2 in his electron wavelength calculation for the value of N. And he says, 'Why 2?' And in my calculation of the math ratios, (B acknowledges.) I have the same thing, 'Why 2?'

B: But in the ratio, does it eliminate or not these two? Because you have ratio…

Y: …the mass… Yes, between the electron and the muon, the mass ratios of the two. They've compared to the measurement is – no, there's no two here. (B acknowledges.) And compared to the measurement, you have to multiply by two exactly. **[Recording time 37:10]** So, either there's something they're doing when they are measuring the value of the electron…is that it automatically is including or not including the electron antiparticle, the positron, which has the same mass. You see, this ratio you have here is how I calculated the mass ratios. And the mass ratio is related, not immediately, but is related to the Compton wavelength. Let me give you their formula for the Compton wavelength. It is Planck Constant *h*…Planck Constant *h*…

B: I'm looking for it.

Y: It's under Muon. (B acknowledges.) Planck Constant divided by the mass of the muon, times the speed of light. And that's how they get the Compton wavelength. So its **[Recording time 38:30]** proportion to the speed of light is fixed and the Planck Constant is fixed. So the Compton wavelength is proportional to the mass of the fermion. In this case, it's the mass of the muon, $M_u$. So if you put electron in there instead, you get the Compton wavelength based upon the mass. So what you're doing is having analyzed this from the point of view of waves. And I've done it from the point of view of masses. And the values come out mathematically to be equivalent. But maybe we can figure out 'Why 2?'

B: Once the common knowledge is established, you have both…

Y: Well, for one circuit…

B: Yes.

Y: …we have electron. And for two, we have the muon. And for three, it should be the tau particle.

B: For three? Then let us do it for three.

Y: Yes. Well, this does a lot of things. It confirms that these F numbers are correct. (B acknowledges.) It's also, that our dividing by the square root of 2N is correct. (Biljana acknowledges.) That our assumption of the Planck length and the Planck time as being fundamental, are correct. That they're discrete at the level of Planck length and Planck time. So it tells us all our assumptions along the line…

B: And the number of Individuals.

Y: And the number of N and 10 to the e to the pi is correct.

B: Yes, it's tremendous. I couldn't believe. Really, I don't believe. It is so tremendous, it's beautiful!

Punita: Good stuff, Biljana. Really, it is beautiful.

Y: So! ...so I'm satisfied. (Biljana acknowledges.)

Punita: Biljana, you pointed to a certain expression being elegant. (B acknowledges.) And, I just want to take a look…

B: Yes… **[Recording time 41:20]**

Punita: It's … **[Recording time 41:24]**

Y: You might work out the part that you've set aside, the little part. (B acknowledges.) It sounds like it doesn't matter because…well, what…you see there's only – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 – ten significant figures. And we were talking about thirty orders of magnitude in that little part. And so it probably wouldn't matter. It might matter on the tau particle because it multiplies. (B acknowledges.) And the measurement on the tau particle…there's an argument. There's two different measurement methods. And one of them agrees with my calculation based on mass and the one that's recently been done. And it would tell us which one is correct. It tells us that our recursion assumptions are also correct.

B: Yes. Tremendous! It's pure beauty.

Y: The original pattern has been recursed and recursed again.

B: Maybe also to take your value for Planck length will refine the result.

Y: I'll find that. (B acknowledges.) [Yogeshwar starts looking for it for a couple of minutes.]

Punita: Biljana, I've got a question on one of your calculations here; that one. Yes…let's look on the previous page. I just want a…OK, well…that the fourth root of 24… Well, here it should be the cubed root on N… **[Recording time 45:55]**

B: Ah yes, it's a mistake.

Punita: Yes. That should be the cubed root of…yes, the cubed root of…

B: Yes, yes.

Punita: Because that's going to change it. (B acknowledges.) See your ratio here is one fourth. **[Recording time 46:06]**

B: Ah, you know, but here they are.

Punita: Yes. I know.

B: This is 6N to the $2/3^{rds}$. (P acknowledges.) This is 24N to the $3/4^{ths}$. And these are taken into account. So those are taken into account; and this is what is…

Punita: Ahh, I'm… I'm…?

B: Ah, yes, yes, yes. You are right. It should be 6 to the $1/3^{rd}$ also, (P acknowledges.) and then…

Punita: Yes, because that will change this $1/4^{th}$…

B: Yes, this will change.

Punita: …and so that's going to…

B: Maybe it will be…it will be still negligible. But still, it will be another number here. (P acknowledges.) The degree will be the same. But, yes, yes, it should be corrected.

Punita: But I think that's been repeated in other places also. And I'm just wondering. I don't think it will have a lot of effect…

B: No, no. It is not repeated; it is just there. Here I have done it well. Here it's…

Punita: OK. OK

B: Only there.

Punita: All right. No, no, wait. But up here…turn on the next page...

B: I was trying to avoid…I had another version when I have all this replaced. (P acknowledges.) But then I have done it more elegantly and this is the elegant version.

Punita: OK. Yes, here…well… **[Recording time 47:42]** to the $24^{th}$. See here we show up again and I think…what about something there?

B: From Mathematica, N to the $1/4^{th}$. This is 24; this is fourth root of 24. (P acknowledges.) So that's in the denominator…

Punita: OK, so it's good.

B: It's good, yes.

Punita: So the calculation was good. OK. It was just somewhere in the transposition… (B acknowledges.) No, I was just wondering if that might be a thing that would bring it closer, get us more digits. (B acknowledges.) It's very exciting. I mean it's one of those things of beauty, you know? I mean real beauty.

B: Pure beauty due to the underlying theory. That's great. This is wonderful!

Punita: To come at the same result from two different perspectives, two different lines of reasoning. One could say one line of reasoning is incorrect; but when you have two independent lines of reasoning, and they both converge at the same values, it's very powerful. Very beautiful. (Quiet for minutes)

Punita: It's exciting; isn't it? (B laughs.)

Y: You want *lp* in centimeters? (B acknowledges.) One point six one six seven nine six five four nine times 10 the minus $33^{rd}$ of a centimeter. You need to convert that to meters. (B acknowledges.) And the formula for it…I'll just give that to you: e to the plus minus – that's the electric charge value – times K minus one. K minus one (B acknowledges.)…that is the average number K. And this is the number.

B: Ah, great. Great.

Y: It was the next to the last piece of paper.

B: It is beautiful. It's tremendous. So, it's so…unbelievable actually. So all this…F of three, F of four…they all prove to be correct.

Y: They prove to be right.

B: To be right… No matter how this is probability. And we had suspicions regarding maybe this other structure should be taken into account, and so on, and so on. But this is all correct. This is all correct. And also *tq* is correct.

Y: Well, at least it's correct to three or four places. (P&D laugh.)

B: Well, OK. But that's great!

Y: And that means that there may be little factors that will have to be taken into account.

B: They don't have Collider as they have in CERN. **[Recording time 53:40]** They are just measuring**.** (P laughs.) But this is done with pure thinking. (P acknowledges.)

Y: All from theory. (P&B acknowledge.) Actually, it's from the experience of Individuals and their first person experiences. And, of course, we have the measurements made by scientists. And it all fits together. It was this kind of development that I was looking for. But I didn't know enough mathematics to do myself. And your understanding of topology and of wave theory… (B acknowledges.) It takes all those put together. (B acknowledges.) That's how you're doing that.

B: Because the wave theory is similar like in electronic circuits, you know. Once I have looked at the equations in modern physics book, in particles, I have seen this is similar. I…I could understand it easily once I had some background in particle physics. It is the same.

Y: It also tells us that when we say F3 and F4… I said that F3 is the electron; (B acknowledges.) based upon other logical reasoning. (B acknowledges.) And not only that, that it doesn't decay. And therefore, since F3 is the electron and an electron doesn't decay - it's not expected to decay under any circumstances - that tells us that the assumption about the number of dimensions of space is correct because the electron, I showed you, is made with three dimensions. (B acknowledges.) And that's why, for the same reason the electron does not decay, is the same reason why we…the least number of space dimensions in this world is three. And they don't decay. Whereas, the fourth dimension, (Y makes a mouth sound which means 'gone'.) they last for 10 to the minus 22$^{nd}$ of a second. (B acknowledges.). That's not much time. (Everyone laughs.) We don't even have Greek names for those. OK, I'm still making correlations of what this shows us.

B: Yes. It's beautiful. I'm very glad because now we can do the tau particle. (Laughs) Next step. I was trying this way and that way, you know. And it helped me that I was looking at it on a sphere, not on a plane, but on a sphere. (Y acknowledges.) When you look at it on a sphere, it's easier. And actually, it came right.

Y: Only a topologist would do that, (B acknowledges.) or Penrose. He thinks like that too. Maybe we'll take a break; and you can work on that if you want to. (B acknowledges.) Or whatever you want because we have a…

B: Ah, yes. Another class.

Y: We'll have another one, and then we'll have this afternoon. (B acknowledges.) We have satsanga where we share. You're welcome to come if you want.

B: Thank you.

Y: OK, then we'll take a break.

B: Yes. Thank you.