

Consciousness and Physics: Towards a scientific proof that consciousness is in Space-Time beyond the brain

**Consciencia y Física:
Una aproximación científica a la existencia de la consciencia en tiempo
y espacio más allá del cerebro físico**

Jan Pilotti*
University Hospital of Örebro
Örebro, Sweden

Abstract

New discoveries in physics indicate particles with superlight velocities. These have been predicted in an extension of Einstein's theory of special relativity to six dimensions, three space and three time dimensions. It is shown that this six-dimensional space-time also can be used to describe consciousness and that this also is needed to counteract some seeming paradoxes in the purely physical interpretation. This shows a deep connection between physics and consciousness and suggests an increased study in the 'transphysical' in connection to the transpersonal. It is argued that this description of consciousness actually solves Chalmers' hard problem of consciousness by transforming it to easy problems related to space-time instead of the brain. It is also argued as a first position that the mind-body problem is undecidable (in Gödel's sense) but as a second position it is possible, by studying how many dimensions we can experience, to show that consciousness is beyond the brain.

Key words: Consciousness, Physics, Space-Time, Hard problem, Beyond brain

Resumen

Los nuevos descubrimientos en física han mostrado que las partículas tienen velocidades mayores a la velocidad de la luz. Esto ya había sido predicho en una ampliación de la teoría de Einstein sobre la relatividad especial a seis dimensiones, tres en espacio y tres en tiempo. Se ha demostrado que ésta sexta dimensión espacio/tiempo también puede ser utilizada para describir la consciencia, algo necesario para refutar algunas paradojas en la interpretación puramente física de la misma. Esto muestra una profunda conexión entre la física y la consciencia, y sugiere un incremento en el estudio de lo "transfísico", en conexión con lo transpersonal. En el presente trabajo se discute si ésta descripción de la consciencia realmente soluciona el gran problema que propone Chalmers sobre la consciencia, transformándola en problemas fáciles relacionados al tiempo y espacio, en lugar de relacionarlos con el cerebro físico. También se discute que el problema mente/cuerpo no se pueda clarificar más, puesto que se ha estudiado cómo diferentes dimensiones que podemos experimentar, muestran que la consciencia existe más allá del cerebro físico.

Palabras Clave: Consciencia, Física, Espacio-Tiempo, Gran problema, Más allá del cerebro

Received: 8 January, 2012
Accepted: 15 March, 2012

Introduction

There is a well-known story about when the Gods created the world. They wanted to prolong the adventure by hiding the truth. One God suggested hiding the truth in the deepest mine in Earth. But people would very soon fall into that. Another God suggested the highest mountaintop, but people are so competitive they would climb every mountain. Hiding the truth in the deepest ocean or on the back of the moon is just a little better, because people would find it by just continued expansion in space. So eventually the wisest God said: "No, we shall hide the truth where humans will look last - in themselves and to prolong the adventure even longer we will create The Grand Illusion that they can find the truth about themselves in the brain, whereas the truth lives in their hearts!".

The heart here is of course the expression of the holistic intuitive wisdom. I also think that this is not just metaphoric story but a good scientific hypothesis. There are accomplished and pending discoveries within physics which broaden our concepts of reality and I will argue that this also will be connected with a new understanding of consciousness. It seems to be time to study the 'transphysical' in the same sense as we study the transpersonal. Not to discard the established knowledge but to realize its limits and add new insights and experiences leading to wisdom. I also think there is very deep connection between the transpersonal and the transphysical.

Nobel prize, dark energy - faster than light and consciousness?

The Nobel Prize in physics 2011 was awarded to Saul Perlmutter, Brian Schmidt and Adam Riess for their discovery that our universe expands with increasing velocity. The cause for this acceleration is unknown but is called dark energy. The Swedish Royal Academy of Science states in the declamation for the Nobel Prize that dark energy is perhaps the greatest riddle in physics. They also say, however, it is known that this dark energy is three quarters of all that exists. Earlier dark matter had been suggested to explain the faster rotation of galaxies. Dark energy and dark matter is thought to make up 95% and our ordinary matter just 5% of what exists in our universe. I think it is really a great achievement of science to be able to say that most that exists is unknown. In the same way Socrates said 'I am the wisest man alive, for I know one thing, and that is that I know nothing'. "It exists" is an interesting criticism of this cosmological view, instead emphasizing the electrical plasma more than gravity (Scott, 2006). I will also study that but it doesn't change my main argument.

Yet we must try to search for the truth and speculate. It has been speculated that dark matter could be neutrinos. But dark matter can also be predicted from an extension of the special theory of relativity to six dimensions, three space and three time dimensions. However most physicists haven't accepted this theory as it allows faster than light velocities and even worse allows reversal of the order between cause and effect. This threatens a very basic dogma of science or actually a materialistic interpretation of science. But now there is data, which can be interpreted that neutrinos can have superlight velocity. Could there be any connections?

Superlight neutrinos versus Einstein?

The results of measuring neutrinos with superlight velocity have now been replicated twice by the same group connected to CERN (European Organization for Nuclear Research) in Europe and with the same method. This replication of course increases the possibility for a break through. Recently criticism say that it could be an experimental flaw and new experiments will be done at CERN and also by other groups and with other methodology during 2012 both in USA and Japan (Grossman, 2011).

But even if these results will be corroborated and are correct it of course doesn't mean that Einstein's special theory of relativity loses its validity in the areas where it has been tested with success. That is for all velocities lower than that of light in vacuum and still with all the consequences, which earlier was thought to contradict common sense: e.g. that time goes slower and that objects are shortened when we move, that is time and space are relative, dependent on the movement of the observer. Even simultaneity is relative. But not all is relative! Einstein pondered to call his theory 'The Theory of the Absolute' as it also shows what is absolute, that is the same for all observers irrespective of their relative movement: namely the velocity of light in vacuum (which actually was one of Einstein's postulates based on the Michelson – Morley experiment) and also that the space-time interval between two events is absolute. However, what is to be discarded is the idea that there is nothing, which can move faster than light in vacuum. This is often thought to be a necessary result of Einstein's special theory of relativity and Einstein himself argued for it.

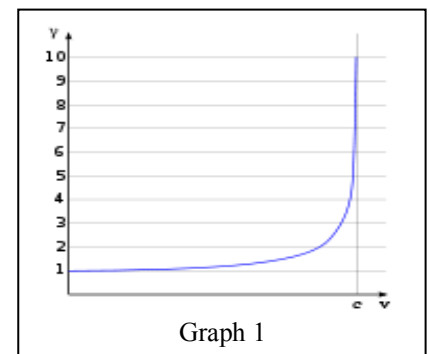
But Einstein rises again!

All know about the 'most famous formula' $E=mc^2$. A formula with much evil use (nuclear weapons), with much problematic use (nuclear power plants) but also with most beneficial use –it is the way for our Sun to transform mass to energy which is the basis of all life on earth on the physical plane. However mass is also relative - the mass or weight of our bodies actually increases when we run, as does the mass of all moving bodies. But we don't notice these effects in daily life because our velocities are almost zero compared with the velocity of light in a vacuum (ca. 300 000km/s) that is 7.5 turns around the Equator of the Earth in one second! However for higher velocities it is notable. Again, all know that the energy of moving bodies increases with velocity – we shall not have elephants in the backseat. According to the pre-relativistic physics, which still works very well in daily life, the energy of moving bodies increases with the square of the velocity, that is if the velocity is doubled the energy increases four times, with much more damage, e.g. in a car accident. But Einstein showed that the energy increases much more for higher velocities and according to the formula:

$$E = \frac{m_0 c^2}{\sqrt{1 - \frac{v^2}{c^2}}}$$

and as the Graph 1 shows an infinite amount of energy is needed to reach velocity of light and it is impossible to exceed it. This was also Einstein's original argument why we couldn't reach beyond the velocity of light in a vacuum c , However light in vacuum travels with c ! Yes, but light doesn't start from zero and accelerates but is 'born' with that velocity c , -'a flying start'.

Therefore Einstein's theory doesn't exclude particles with superlight velocity if they are born with that velocity, but alternatively they cannot slow down to velocities lower than c . This was argued already in the 1960s (Bilaniuk, Deshpande, Sudarshan, 1962; Tanaka, 1960; Feinberg, unpubl). Even if it of course was unclear what this superlight



phenomena could be it was at that time thought of as particles and even given the name “tachyons” from Greek ‘tachy’, meaning fast (Feinberg, 1967).

Possible extensions of Einstein’s theory of relativity

Parker (1969) showed a mathematical possibility to describe superlight velocities in two dimensions, one space and one time dimension, but explicitly stated it was not possible in his way for our four-dimensional space-time.

However in the beginning of the 1970s, to my knowledge, at least four/five different researchers independently discovered the possibility to describe phenomena with superlight velocity, in complete agreement with Einstein’s special theory of relativity, if some extensions were made.

One group (Recami and Mignani, 1974) allowed imaginary numbers in the generalised Lorentz transformation for superlight velocities and the three others (Cole, 1977; Pavsic, unpubl.; Pilotti, unpubl.) used real transformations but in a six-dimensional space-time with three space dimensions and three time dimensions. Cole (2000) has also showed how in this six-dimensional space-time you can predict the so-called dark matter, which according to many cosmologists is needed to explain the higher rotation velocity of galaxies. So perhaps there is even more to this six-dimensional space-time than just tachyons? As matter and energy are equivalent and can be transformed into each other it is perhaps possible to describe even dark energy in this theory. Cole (1980) has also shown that in six-dimensional space-time the electrical field gets extra components and also the existence of a totally new field, and fields have energy so again perhaps a possibility for dark energy. Also matter is to some extent more extended in space, more “space-like”, whereas energy is a “driving force” for processes in time, that is more “time-like”. So it seems possible that three time dimensions could allow more “time” for energy. (See also one of Heisenberg’s uncertainty relations $\Delta E \Delta t \geq h/4\pi$ to realize the deep connection between energy and time.)

Order of cause and effect relative?

Most physicists have, however, discarded this six-dimensional space-time theory due to consequences, which were seen as unacceptable, e.g. that it allows superlight velocities. But perhaps now these have been shown to exist. However another consequence of the existence of superlight velocities is that the order between cause and effect is different for different observers, that is, even the order of cause and effect becomes relative. This seems even more contradictory to common sense as it seems to allow paradoxes like time-travel back in time where one can prevent one’s own coming to birth. So the order between cause and effect seems absolutely to be absolute? If A causes B, so must A come before B for all observers? Yes, seemingly so in physics. But there is an important phenomenon where this change of order between cause and effect can rather be an asset – namely consciousness, which, however, is not a subject for most physicists.

Mind-body problem not yet solved!

David Chalmers (1995, 2010) differentiates between “*the easy problems*”, mainly different behaviours, which can be explained by the brain and “*the hard problem*”, the conscious experiences, which yet defy any explanation at all. Chalmers (2010) argues against materialist views and for a view on which consciousness is irreducible and that epiphenomenalism, Russell’s monistic materialism (Russell, 1927) and even dualism are

equally good possible solutions to mind-body problems. Russel and Chalmers argues that perhaps the intrinsic properties of the physical world are themselves phenomenal properties. But I think also materialistic 'identists' are right at least when they say that our sensory experiences are material –but not material in the brain which they don't even look like, but matter outside the brain -out there, where we really locate what we see. A grand old man in neurophysiology Benjamin Libet (1978) also writes that this automatic subjective referral of our sensory experiences to the space around us is still mysterious. Manzotti (2011) also argues for externalist view of consciousness. (See also <http://www.consciousness.it/> for video lectures and informative cartoon on Externalism).

Space-time and consciousness

However there is a possible relation between space-time and consciousness. All that has happened, all that is happening and all that will happen, that is the past, the now and the future exist at once in space-time. But as space and time taken separately are relative while measurements in space-time are absolute, according to Einstein's special relativity, it seems evident that space-time is a more basic concept and even more ontologically real. (An elementary introduction to space-time see e.g. Pilotti, 2011. History of electromagnetism up to space-time at <http://www.drpilotti.info/eng/theory-of-relativity.html>).

Concerning conscious phenomena such as e.g. near-death-experiences there are many people who have seen their whole life from birth to now, and even the future as one single picture. Just one example from Geddes (1937) who reported it in Royal Medical Society:

*I was very ill...but realised that my consciousness was separating from another consciousness which also was me... consciousness, which was now me, seemed to be altogether outside my body, which it could see. Gradually I realised that I could see not only see my body and the bed in which it was, but everything in the whole house and garden and the I realised that I was seeing not only 'things' at home but in London and Scotland, in fact wherever my attention was directed it seemed to me; and the explanation which I received ...was that I was **free in a time dimension of space wherein 'now' was in some way equivalent to 'here' in the ordinary three-dimensional space of everyday life**. I next realised that my vision included not only 'things' in the ordinary three-dimensional world but also 'things' in these for or more dimensional places that I was in'.*

This bold sentence is a very good description of space-time. It is therefore possible to interpret these experiences, when people see their whole lives, as that the persons experienced time as space, that is they experienced the real four-dimensional space-time where everything which has happened, happens and will happen - exists at once. In Figure 1 every point on the one-dimensional-time axis is the whole three-dimensional world in space at that time. But then all is seemingly predetermined, which seems to contradict quantum mechanic indeterminism and even more important our direct experience of free will.

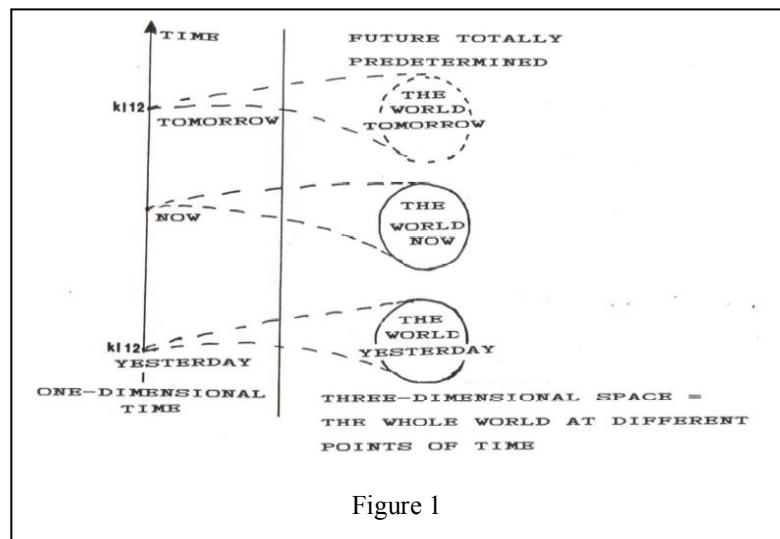


Figure 1

But in six-dimensional space-time with three time dimensions the picture changes dramatically (see Figure 2) and now we have many, perhaps infinite, possibilities for the future (not just three as in the Figure 2).

Every point in the three-dimensional 'timebox' is a whole **possible** three-dimensional world in space. (Pilotti, 1986, 1987, 1989, 1990, 1999, 2011 a-c).

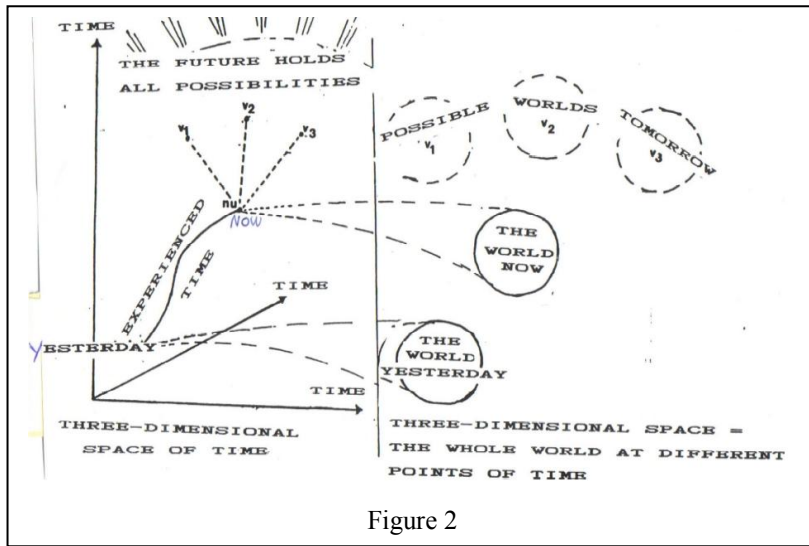


Figure 2

Possibilities, reality and free will

In this view which of the possible worlds that will become real depends on all our choices, as the simplified Figure 3 shows. Dependent on A's and B's independent choices - to be at home or to go to a concert, one of the four possible worlds will be physical real in our three-dimensional world in space, while the other possibilities will continue to exist in the mental as non-realised possibilities.

These can be experienced as lost opportunities, dreams, fantasies etc. (Pilotti, 1986, 1987, 1989, 1990, 1999, 2011 a-c). There is namely a significant difference between possibility and reality. Hegel said that which is real must sometimes have been possible, but that which is possible might happen to be real but doesn't need to happen to be real. The easiest way to convince oneself of this significance is to reflect over possible versus real human relations.

Consciousness in space-time

You are now reading on a screen or a printed out paper. Where is the screen/the paper? I think you agree that they are out there in front of your head and your brain. Where is your visual experience of the screen/the paper? If you answer 'in my brain' I must ask you: 'How then do you know there is a screen/paper outside the brain'? I will also ask you to reconsider your view, forgetting all what you have heard and learnt, and be true to your direct experience.

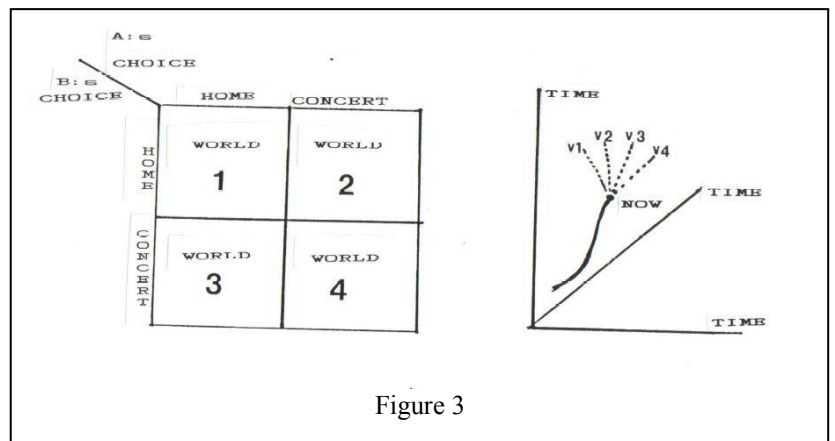


Figure 3

I have never ever experienced anything in my brain, and I doubt that any one else has, in their brains. To me it is now as self-evident as anything can be that all my sensory experiences are outside the brain, in the body or in the space around me. Touch is in the body where I feel the touch. Taste is in the mouth and smell is in the nose. Hearing and sight, exactly as Libet (1978) said we mysteriously project out there to the space around the body. But what about memory, thoughts, fantasies, dreams and all other mental experiences? To begin with memory, we know that injuries to the brain can affect memory but you can't tell if it affects storage of memory or just the possibility to retrieve it. As all that has happened still exists in spacetime there is no need for any extra storage. Entities that through evolution learn to use the 'space-time library' will of course have a great advantage over those who have to store everything in their brain, which is just a small part of the whole space-time. In short I will argue that it is a possible and relevant description to say that our

sensory experiences are identical with matter, not in the brain, but out there in the now, the space or matter aspect of space-time, and all other mental experiences are in time, outside the now, the time-aspect of space-time and identical with possibilities in the six-dimensional space-time.

A thought about the future is interpreted as a future possibility, which exists in the future of space-time, because in space-time all that will happen already exists. When I write this sentence on my computer it is an adequate description for another person, the so called third person perspective, to state that processes in my brain are the causes of the movement of my arms and fingers to touch the keyboard causing the text on the screen. But in my own perspective, the first person perspective, it is an equally adequate description to state that it is my thought which is equal to my mental picture of the text on the screen in a possible future world which causes the writing. That is, the order between cause and effect is relative and dependent on the perspective of the observer and concerning consciousness this reversal of the order between cause and effect is an asset and explains the difference between third person and first person perspectives.

Thus interpreted the phenomenon which has superlight velocity is not (ordinary) matter but consciousness and thus there is no paradox with time-travel back in time and what we then experience is only experiences in our mind and can no longer affect the common world of manifested realities. We can only affect the real world by choosing between coming possibilities. (Strömberg, 1965; Pilotti, 1986, 1987, 1989, 1990, 1999, 2011 a-c).

Brainism or space-time-ism undecidable?

Gödel (1931) proved that in formal logical systems there are interesting questions that cannot be answered within a given system which are then undecidable. As natural sciences, especially physics, use much mathematics and logic it is conceivable that there could be theoretically undecidable problems in science. Normally in empirical science questions can often be answered empirically as e.g. when observation showed that Einstein's theory of relativity gave accurate predictions, where Newton's classical physics did not.

But the mind-body problem seems not to be empirically answerable because the empirical content of existing mind-body 'theories' is inadequate. No 'theory' seemingly can predict what experiences are possible and which are not.

Non-materialistic views on the mind-body-problem, that is that mind cannot be explained by the brain, which I call 'soul-ism' or here space-time-ism, cannot be falsified by empirical data and are therefore unscientific in the meaning of Popper (1974). But the materialistic views, that all experiences can be explained by the brain, "brain-ism", are equally inadequate in this respect, as there seems not to exist any empirical phenomenon that can be observed, in this life before death, which must be accepted as a falsification of the materialistic view.

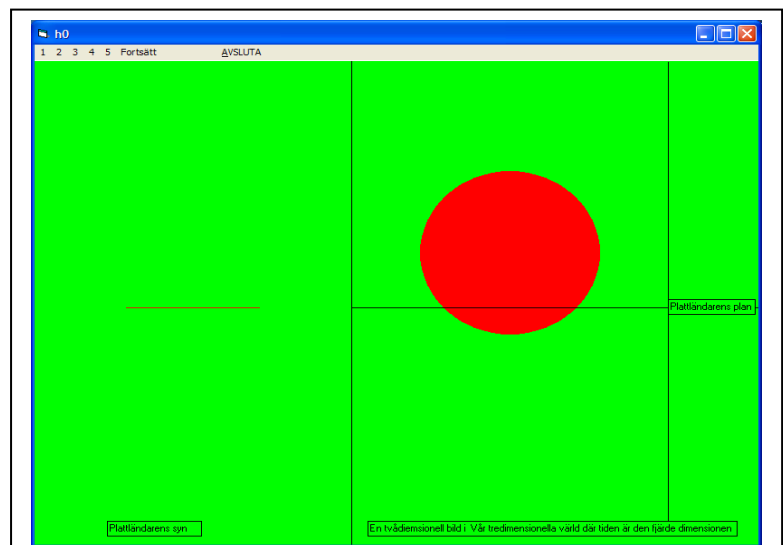


Figure 4

Picture from an animation showing how a 2D circle passes a 1D space as an analogy to a 3D projection on 2D.

A model to illustrate this is the “experiences of a flatlander” (Abbott, 2001; Pilotti, 2003. Animation in Visual Basic, see Figure 4) for whom it cannot be empirically decided within flatland science if the phenomenon they experience exists only in two dimensions or are projections of higher dimensions. Flatlanders see a point coming from nowhere and growing to a line and then contracting and vanishing even if in reality it is a disk passing Flatland and this is thus undecidable within Flatland. (In the Figure 4 we just see this from the side i.e. a 2D perspective. See also a fine animation by Dr Quantum though for the sake of drama with some minor incorrectness <http://www.youtube.com/watch?v=BWyTxCsIXE4>). Even if a Flatlander had had a 3D vision and could have our experience of the phenomenon in three dimensions and thus know the existence of three dimensions he cannot prove it to the still flat Flatlanders. By analogy if and when we experience ‘life after death’ this will be a falsification of materialism but falsifiability and Popperian scientificity must be defined in the life before death.

But could not good evidence for parapsychological phenomena be a falsification? No, because every experience which is reported in this life uses the brain and will almost inevitably, and by definition, be interpreted by a materialist as ‘it was strange it must be something in the brain’. But this fundamental limitation depends on that parapsychology (to my knowledge) focus on information, which must be checked in ordinary life. For example even the best cases of mediumistic information from alleged dead people can only be checked with data available in this world of life before death and therefore Super-ESP can never be excluded on empirical grounds.

So my first conclusion is that the mind-body problem cannot be resolved within existing science. So we have to choose on other grounds. Sometimes it is proposed that we according to the principle of Occam’s razor should choose materialism, which is simpler. But materialism has not yet explained consciousness, and more importantly; on what grounds should we choose simplicity instead of meaning? (Pilotti, 2006, 2011 a-c).

Yet a possible proof?

But there might still exist a more empirical approach, which can, at least subjectively, falsify materialism and therefore decide the question. Instead of looking at information, which the brain, according to materialists, is so good at, we can look at the very structure of experience at its base, namely the number of dimensions we can experience. In our world we can experience three independent space directions: length, breadth and height and our physical space and all its material objects are three-dimensional. We can also experience changes in the three-dimensional objects, and thereby experience time. Thus our world is four-dimensional but we cannot point to any direction of the time dimension. I think this is as self-evident as anything can be and this is also the basis of classical physics. As a thought-experiment we can try to experience a world as a Linelander (who can move just back and forth) and a Flatlander (who can move back and forth, and right and left) compared with ourselves who can move back and forth, right and left, up and down. I think we could easily discriminate between these three different worlds.

Even if the materialistic belief is that the brain can produce all possible experiences how this can be done is not shown. Damasio (1999) writes that by the year 2050 it will be solved, but he knows that it is not yet done.

“No one has produced any plausible explanation as to how the experience of the redness of red could arise from the action of the brain” (Crick and Koch 2003).

A more limited and probably simpler problem to start with would be to show if and how a three dimensional brain could produce experiences of more than three dimensions. This problem can be approached in three ways, which together could give a reasonable answer:

TASK 1. To construct a theory which shows how a three dimensional structure can produce an experience including four independent directions of movement. Or by analysis of possible alleged materialistic theories for consciousness show that the project is impossible on logical and mathematical grounds.

TASK 2. To construct non-materialistic theories which do explain or describe how we can experience more than three dimensions. This I believe is possible in the way I have shown above.

TASK 3. To show that there exist experiences, which includes more than three dimensions. This also seems possible.

To start with TASK 3, the experiences, -they are already described at least anecdotally. As already mentioned when people in Near Death Experiences and Out of Body Experiences (NDE/OBE) experience their whole life at once and sometimes even can walk back and forward in time as if it was a space dimension, this can be interpreted as they experience four dimensions: our three dimensional space and time as a fourth dimension and even an extra time-dimension as they move in this four-dimensional space-time. So actually it can be interpreted as an experience of five dimensions. In 'Beyond the brain' Stanislav Grof (1985) also reports that mathematically and physically educated scholars in psychedelic sessions could have insights, not imaginable in ordinary states of consciousness, to many dimensional space.

To call this experiences hallucinations is no explanation. It must at least be shown how a three dimensional brain can produce a hallucination of four dimensions. That people say it clearly differs from dreams and hallucinations and is more real than reality can be seen as a support of that it is an experience of a totally new quality, which fits an experience of higher dimensions.

True that these experiences cannot be objectively measured in our ordinary three-dimensional laboratories, so we can only have people's subjective experiences as an indication. Again true that we can misinterpret our experiences. But I think it is fundamental how many dimensions we can experience so mistakes can be avoided. Again true some training is needed to have these experiences, if they can be voluntarily produced, and we also need to train to focus on dimensionality. This might seem not scientific enough but if as proposed here the mind-body problem cannot be decided by ordinary science at all it seems to be all that is left.

It is also not in opposition to good empirical science if it can be shown that training procedures exist, which can lead us to these experiences of higher dimension. All science demands training before you can do it properly. The problem here is that we probably must go beyond the dimensions we experience in ordinary life to fully understand consciousness and parapsychological phenomena. But when science goes into new fields we are not entitled to demand that the old views are enough.

Then to TASK 1. If one, as I propose, at first we accept the four-dimensional space-time as an objective reality this seems to complicate my strategy to show that a three-dimensional brain cannot create four-dimensional experiences. Because in the four-dimensional space-time the brain is also four-dimensional and can more easily be trusted to create four-dimensional experiences. True but a four-dimensional brain in space-time has an eternal existence. So this argument leads to some existence beyond or after the destruction

of the old three-dimensional brain. Perhaps a life beyond death, which is just the sum of what has been experienced but yet eternal.

But again if also the six-dimensional space-time is supposed to have an objective existence, the afterlife can be believed to be more creative. The basic scientific question can better be formulated: can a four-dimensional brain create experiences with five or more dimensions? As also described above we already have experiences of at least five dimensions. So I think the proposed analysis in TASK 1-3 could possibly resolve this. (Pilotti 2006, 2011 a-c).

Future work

To further develop the description of consciousness in six-dimensional space-time. I don't say that this explains consciousness. But I will argue that consciousness doesn't need to be explained because we already know what it is by direct experiences. Actually the only 'thing' we don't have to explain. What is needed is to describe consciousness and how different experiences are related. I do think that to describe consciousness as related to space-time, and not just to the brain, which is but a tiny part of space-time, actually is a possible way to transform the hard problem of consciousness to easy problems, albeit related to space-time. Of course these problems are interesting and technically difficult but easy in Chalmers's sense.

To gather more of the anecdotal experiences, which indicate five or more dimensions, is also an important task. Even better if we could develop procedures, which can induce such experiences and/or reproduce the sessions, which Grof (1985) writes about, it will strengthen the case even more. In spontaneous cases I think most persons will be so thrilled by the experience per se so they will not be engaged in the physicist's fascination of counting dimensions. However if we more or less can induce these experiences in 'transpersonal-nauts' they can be trained in the task of dimension hunting or actually counting.

Even if these two tasks which are almost already done, will be fully successful, I reckon that many materialists still will say 'O it must be some new processes in the brain' and we are back to the undecidable. If they at least admit that and that they too are just believers, it would be a better climate for research. But I doubt that too. Actually I think they have the burden of proof for as I see it their claim is much stranger than mine.

However as I have a strong intuition, which admittedly could be wrong, that brain-ism is false and that it is possible to logically and mathematically prove that a four-dimensional brain in no sense can 'produce', 'create', 'emerge' the reported five dimensional experiences, I think the easier, scientific and moral, burden is ours. We should once and for all show that consciousness is beyond the brain with the procedure described here or in other ways. This is the very task not just scientifically, but even more important for the solution of the current global crisis as Stanislav Grof (1985) so amply expresses in *Beyond the Brain*.

References

- Abbott E. and Burger D. (2001). *Flatland, Sphereland*. New York: Collins.
- Bilaniuk, O.M.P., Deshpande, V.K. and Sudarshan, E.C.G. (1962). MetaRelativity. *American Journal of Physics*, 30, (10), pp.718.
- Chalmers, D. (1995). Facing up to the problems of consciousness. *J of Consciousness Studies*, 2 (3): 200-19.

- Chalmers, D. (2010) *The character of consciousness*. Oxford University Press.
- Cole, E.A.B. (1977). Superluminal Transformations Using Either Complex Space-Time or Real Space-Time Symmetry. *Il Nuovo Cimento* 40A, 171-180,
- Cole, E.A.B. (1980). New Electromagnetic Fields in Six-Dimensional Special Relativity. *Il Nuovo Cimento* 60A, 1-12.
- Cole, E.A.B. (2000). Prediction of dark matter using six-dimensional special relativity. *Il Nuovo Cimento* 115 B, 1149-1158.
- Crick, F., Koch, C. (2003) A Framework for Consciousness. *Nature Neuroscience* 6 (2). 119-126.
- Damasio, A. (1999) How the brain creates the mind. *Scientific American*, 281: 74-79.
- Feinberg, G. (1967). Possibility of Faster-Than-Light Particles. *The Physical Review* 159, (5), 1089-1105.
- Feinberg, G. (unpubl). See Feinberg G (1967).
- Geddes, A. (1937). A voice from the grandstand. *Edinburgh Medical Journal*, 44, 365
- Grof, S. (1985) *Beyond the brain*. New York: State University of New York Press
- Grossman, L. (2011). Smart Guide to 2012: Neutrinos may be tachyons. *New Scientist* 2844/45.
- Gödel, K. (1931). *On Formally Undecidable Propositions of Principia Mathematica and Related Systems*. In Heijenoort van, J. (1971). *From Frege to Gödel. A Source Book in Mathematical Logic, 1879-1931*. Cambridge: Harvard University Press.
- Libet, B. (1978). Cerebral correlates of conscious experiences. INSERM Symp. no 6 North-Holland Publ. Comp.
- Manzotti, R. (2011) The Spread Mind. Seven Steps to Situated Consciousness. *Journal of Cosmology*, 14: 4526-4541.
- Parker, L. (1969). Faster-Than-Light Inertial Frames and Tachyons. *Physical Review*. 188(5), 1, 2287-2292.
- Pavsic, M. (unpublished). Manuscript from 1971. From the author matej.pavsic@ijs.si. 2011. See also <http://www-fl.ijs.si/~pavsic/>.
- Pilotti, J (1986) Unpublished notes.
- Pilotti, J. (1987). *Medvetandet och hjärnan*. I Jacobson, N-O. Stockholm. Norstedts. Ed. Nytänkande.
- Pilotti, J (1989). *Near-death-experiences and theory of relativity*. The International Congress: On the meaning of near-death experience. Epistemology, consciousness and therapy. Florö, Norway.
- Pilotti, J (1990). (Article in Swedish: 'The theory of relativity and Consciousness'). Stockholm. SPF-Medelanden 12, 51-59.
- Pilotti, J (1999). *On a mathematical possible extension of space-time in the special theory of relativity to six dimensions and its relation to near-death-experiences and to the mind-matter problem in general*. Paper at Nordic Conference on EXPLORING THE SPIRITUAL DIMENSION, Stockholm (Abstract on my homepage).
- Pilotti, J (2006) *What can a brain really do?*. Abstract, not accepted to an international Conference on parapsychology in Stockholm.
- Pilotti, J. (2011a) History e-m to space-time at <http://www.drpilotti.info/eng/theory-of-relativity.html>
- Pilotti, J (2011b) *What can a brain really do? Mind-body question is either undecidable or materialism is false. Solving the problem of consciousness by transforming the hard problems to easy ones*. Paper presented at Towards a Science of Consciousness, Stockholm.
- Pilotti, J (2011c) *Mind-body problem either undecidable or materialism is false. Relevance for treatment or suicidal intention*. Poster at 14th International Conference for Philosophy and Psychiatry, Gothenburg.
- Pilotti, J (2011d) *What can brain really do?: a non materialistic solution to the hard problem of consciousness*. Presentation on Eurotas 2011 in Varna.
- Pilotti, J (Unpublished) Swedish manuscript (1971). English translation (2011) *Tachyons and tachyonian systems. Generalisation of the special principle of relativity and an idea of six-*

dimensional space-time. <http://drpilotti.angelfire.com/eng/sixdim-relativity.html>

- Popper, K. R. (1974) *The Logic of Scientific Discovery*. London: Hutchinson.
- Recami, E. and Mignani, R. (1974). Classical theory of tachyons (Special relativity extended to superluminal frames and objects” (a preliminary review). *Rivista Nuovo Cimento*, 4, 209-290.
- Russel, B. (1927) *The Analysis of Matter*. London :Kegan Paul.
- Scott, D.E. (2006) *The Electric Sky. A Challenge to the Myths of Modern Astronomy*. Portland: Mikamar Publishing. (<http://www.thunderbolts.info/wp>).
- Strömberg, G. (1965) *The Soul of The Universe*. North Hollywood, California: Educational Research Institute.
- Tanaka, S. (1960) Theory of Matter with Super Light Velocity. *Progress of Theoretical. Physics*. 24 (1) 171-200.

***Jan Pilotti, B.Sc., M.D.** started academically studies in mathematics, physics and mainly theoretical physics. He discovered a mathematically possible extension of Einstein’s theory of special relativity to six dimensions which then could describe phenomenon with velocity faster than light. At that time, 1971, the interest in extra dimensions was not in fashion after the Kaluza-Klein five-dimensional theories had been abandoned and was not revived until string theory came later. So without support for his new idea he left theoretical physics without finishing his doctoral thesis. Ironically on a summer camp with a communist group he had a sort of transpersonal or mystical experience. Starting as a materialist and arguing that it is easy to understand that the brain produces consciousness as a thunderbolt he had the insight - NO two brains or two humans communicate with words, gestures, touch and sometimes even smell and taste. A whole group of humans, the whole planet and the whole universe are more complicated. So even on a materialistic hypothesis he realised the possibility of the Soul of the Universe. He asked himself if there could be some connection to the six-dimensional extension of space-time. One of the first books he read 1971, *The Soul of the Universe* by an American – Swedish astronomer Gustaf Strömberg (1965), originally from 1940, brought the first idea that consciousness and memory is in space-time beyond the brain. He started meditation and reading transpersonal literature (Assagioli) and esoteric literature (Bailey) and then began to study medicine. There he got in contact with Moody’s work on near-death experiences and as these experiences talk about more dimensions, the work on the view of consciousness here described started. Currently, he works as a child and adolescent psychiatrist at University Hospital of Örebro (200 km from Stockholm). His research area connecting physics, consciousness and the transpersonal realm lies between the ordinary institutional divisions so he his doing this research as a free scientist.

Email: dr.pilotti@telia.com

Webpage: <http://www.drpilotti.info/eng>