« From the orbital capture to some types of L.E.N.R. reactions

Introduction to quantum ring theory »

How can 30% of nickel in Rossi's reactor be transmuted into copper?

by Dott. Giuliano Bettini
Retired. Earlier: Selenia SpA, Rome and IDS SpA, Pisa
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Adjunct Professor at Naval Academy, Leghorn (Italian Navy)

Abstract
In the present article I would like to answer a question posed by L. Kowalsky in a recent paper: how can 30% of nickel in Rossi's reactor be transmuted into copper? "Everything should be made as simple as possible, but not simpler", says a guy. I apologizes if I am too simplistic here.

Introduction
The interest on Andrea Rossi's Nickel-Hydrogen Cold Fusion technology is accelerating [1]. However, Rossi says that about 30% of nickel was turned into copper, after 6 months of uninterrupted operation. Kowalski [2]. says that "this seems to be impossible because the produced copper isotopes rapidly decay into Ni". But how it works?

How it works
Following Focardi Rossi [3]. a Ni58 nucleus produces a Copper nucleus according to the reaction

$Ni58 + p \rightarrow Cu59$

Copper nucleus Cu59 decays with positron (e+) and neutrino (v) emission in Ni59 nucleus according to

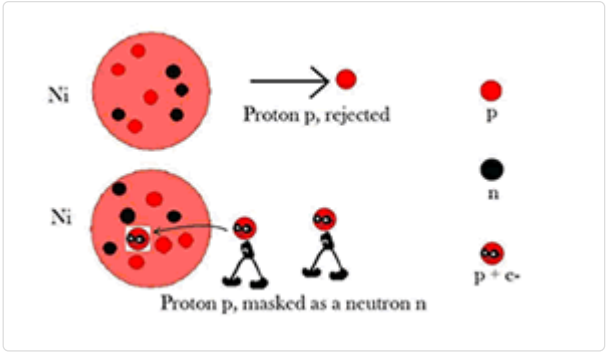
$Cu59 \rightarrow Ni59 + v + e+$

Then (e+) annichilates with (e-) in two gamma-rays

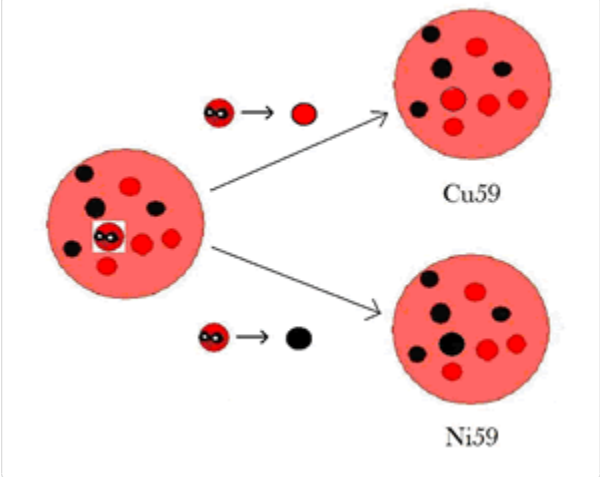
$e- + e+ \rightarrow \gamma + \gamma$

Starting [3] from Ni58 which is the more abundant isotope, we can obtain as described in the two above processes Copper formation and its successive decay in Nickel, producing Ni59, Ni60, Ni61 and Ni62. Because Cu63, which can be formed starting by Ni62, is stable and does not decay in Ni63, the chain stops at Ni62 (i.e. Cu63). Each process means some MeV.

Of course how can a proton p gets captured by the Ni58 nucleus? (and subsequent Ni59, Ni60, Ni61 and Ni62). Following Stremmenos [4]. a neutron-like particle, an electron proton pair, a mini-atom, a proton masked as a neutron, gets captured by the Ni58.



If the masked proton becomes a neutron the result is Ni59.
In order to have Cu59 (increase of atomic number from 28 to 29) the electron (of the masked proton) gets ejected from the nucleus. The masked proton becomes a proton.



The same process holds for all the subsequent transformations, until Cu63.
It remains to be understood the issue of the gamma radiation in the MeV range.

Numbers
I am an electronic engineer, so I need easy numbers in order to understand.
However "Everything should be made as simple as possible, but not simpler", says a guy. Maybe I am too simple here.
Let's calculate.

MeV for each Ni transformation
I read that starting from **Ni58** we can obtain Copper formation and its successive decay in Nickel, producing **Ni59**, **Ni60**, and **Ni62**. The chain stops at **Cu63** stable.
For simplicity I assume all the Nickel in the reactor in the form **Ni58**.
For simplicity I suppose for each **Ni58** the whole sequence of events from **Ni58** to **Cu63** and as a rough estimate I calculate the mass defect between (**Ni58** plus 5 nucleons) and the final state **Cu63**.
Ni58 mass is calculated to be 57.95380± 15 **amu**
The actual mass of a copper-**Cu63** nucleus is 62.91367 **amu**
Mass of **Ni58** plus 5 nucleons is 57.95380+5=62.95380 **amu**
Mass defect is 62.95380-62.91367=0.04013 **amu**
1 amu = 931 MeV is used as a standard conversion
0.04013×931 MeV=37.36 MeV
So each transformation of **Ni58** into **Cu63** releases 37.36MeV of nuclear energy.

Nickel consumption
According to many blogs in the Internet "One hundred grams of nickel powder can power a 10 kW unit for a minimum of six months".
How much of **Ni58** should be transformed, in six months of continuous operation, in order to generate 10 kW?
I follow a procedure outlined in [2].
10 kW is thermal or electrical (?) power. The nuclear power must be larger. Assume a nuclear power twice:
20 kW = 20,000 J/s = 1.25 x 10**17 MeV/s.
Each transformation of **Ni58** into **Cu63** releases 37.36MeV of nuclear energy.
The number of **Ni58** transformations should thus be equal to (1.25 x 10**17)/37.36 = 3.346 x 10**15 per second.
Multiplying by the number of seconds in six months (1.55 x 10**7) the total number of transformed **Ni58** nuclei is 5.186 x 10**22.
This means 5 grams.
The order of magnitude is not exactly the same but seems to be plausible. This means also 5 grams of Nickel in Rossi's reactor transmuted into (stable) Copper after six months of continuous operation at the rate of 10 kW.

Conclusions
Rossi says that about 30% of nickel was turned into copper, after 6 months of uninterrupted operation. At first glance this seems to agree with calculations based on simple assumptions.

References
[1] Link, **Cold Fusion "Andrea Rossi" Method**
[2] L. Kowalski, **"Rossi's Reactors Reality or Fiction?"**, March 2011
[3] A.Rossi, S. Focardi, **http://www.journal-of-nuclear-physics.com**
[4] E. Stremmenos, **"Hydrogen/Nickel cold fusion probable mechanism"**, March 2011

April 4th, 2011 | Category: Publication

670 comments to How can 30% of nickel in Rossi's reactor be transmuted into copper?

« Older Comments 1 … 5 6 7 8 9 … 14 Newer Comments »

Andrea Rossi
May 6th, 2011 at 8:44 AM

Dear Ing. Casaburi:
Please contact me in November for this issue,
Warm regards,
A.R.

Andrea Rossi
May 6th, 2011 at 8:42 AM

Dear Mr Davide C.:
The slides which Prof. Focardi presented in Pavia are from the report of the test made by Prof. Kullander and Prof. Hanno, from the Universities of Uppsala and Steckolm in Sweden, and by Ing. Lewan Mats, of the Sweden scientific journal Nyteknik: you will find the complete reports on the links you can find on this blog.
Warm regards,
A.R.

Davide C.
May 6th, 2011 at 6:43 AM

The 4th of may, in the Department of Nuclear and Theoretical Physics of the University of Pavia, Prof. Focardi showed slides of the first prototypes of the e-cat.
Is it possible to take a look at them? They're very interesting, especially the first e-cat that warmed the water in a bucket, without using running water. And what about their thermal production?
Thanks

Corrado Casaburi
May 6th, 2011 at 4:06 AM

Dear Dr. Rossi,
I'm here to let you know that one more important client of our firm is interested on a pilot in Italy.
If you agree this idea, we are always willing for contacts.

Admiringly,

Ing. Corrado Casaburi

stefano libardi

May 6th, 2011 at 2:33 AM

Caro Ing. Rossi,

non sono un addetto ai lavori ma sto seguendo giornalmente e con grande speranza gli sviluppi del Suo lavoro. Credo che come me molta gente sia dalla sua parte.
In bocca al lupo.

Stefano Libardi (Trento)

Andrea Rossi
May 6th, 2011 at 1:39 AM

Dear Ing. Carlo Ombello,
We have to study about the vehicles applications. We know a major car maker is studying about what you say, but I think we are very far. Anyway: now we have the priority of the October 1 MW plant start up, after that please contact me again on this issue, if you are an expert of the field, and we will work on it.
Warm regards,
A.R.

Carlo Ombello
May 5th, 2011 at 6:11 PM

Mr Rossi,

Marco Barin came just a few hours earlier than me in asking about electric cars. I agree with him that a small E-Cat could help boost success of electric cars, few years from now. Let me explain: new hybrid cars are coming to the market, which are "series hybrids" (ibride con motori in serie). The GM Volt is one of them, where an internal combustion engine is combined in series with the electric motor and batteries, not in order to move the car but only to charge the batteries when they are flat. Older hybrids like the Toyota Prius simply switch and mix from combustion engine to electric engine during the drive (with modest results). Current electric vehicles (EVs) like the Nissan Leaf pack some 24 kWh of Lithium batteries in their belly, for an estimated 100 miles – 160 km range, a rather short run. Should you be able to develop a small – say 10 kW – electric catalyzer, you could fit it in a Nissan Leaf or equivalent, in series with the battery pack and electric engine. The e-cat would always be on, so to top up the battery charge, or help the battery power the vehicle while in motion. The battery would therefore still be the key link between e-cat and electric motor to provide on demand, variable power output modulating it between 0 and 100 kW as requested by driving, but the e-cat would always be on and connected to the battery, keeping it charged for much longer during heavy power usage, and recharging it rather quickly when the car is idle.

If the obstacle of getting a small electric e-cat will be solved, then we're almost there. And nothing should prevent us from thinking bigger, a 50 kW electric e-cat with a small battery or supercapacitor pack would power an electric car nicely. I'd suggest you try and contact Nissan-Renault, with the billions spent on EVs, they will be keen to check out this development.

Regards
Ing. Carlo Ombello

Andrea Rossi
May 5th, 2011 at 5:18 PM

Dear Daniel De Francia:
I gave to three persons of my total trust a letter with which they will go to a study of attorneys at law to get the papers there deposited . In those papers there are all the necessary instructions.
What can I touch? Wood? Steel? Whatever…
Warm regards,
A.R.

Daniel de França MTd2
May 5th, 2011 at 5:02 PM

Dear Mr. Rossi,

You said that only you know the secret formula for the catalyzer. If you die, will everything be lost? If it's lost, do you think by not keeping the formula safe with at least another person, you are being fair with the rest of mankind?

Best,

Daniel.

Andrea Rossi
May 5th, 2011 at 4:40 PM

Dear Randy:
You are right!
He has been invited to visit my 1 MW plant in October in Greece. He has my personal address and he can contact me when he wants.
Warm regards,
A.R.

Andrea Rossi
May 5th, 2011 at 4:38 PM

Grazie: il fatto che debbano tirare fuori errori che ho commesso 20 anni fa per screditare il lavoro di oggi la dice lunga. Comunque, chi vuole leggere come sono andate le cose 20 anni fa, può andare su
http://www.ingandrearossi.com
ammesso che ne abbia il tempo.
Io, comunque, continuo a fare il mio lavoro, l'unica cosa che conta.
Cari saluti,
Andrea Rossi

Andrea Rossi
May 5th, 2011 at 4:32 PM

Dear Mr Marco Barin:
1- I think we are very far from the application of this tech to cars
2- yes, I think that the development will be exponential respect the time
3- I suppose around 400 euro/kW for thermal and 2.000 Euro/kW for electric power
Warmest regards,
A.R.

Andrea Rossi
May 5th, 2011 at 4:23 PM

Mr Miles Mann ("halfdeadcat"):
What you propose is totally useless. Our target is not to play to make you see how brave we are, our target is to make R&D and to make plants that have to be sold to our Customers. Why don't you put square wheels to your car, to proof to us that round wheels are a better solution?
We are working to produce E-Cats that have to be sold to Customers who pay only if the E-Cats work, so we have not time to lose in useless things to get the approval of unproductive (for us) persons.
Warm regards,
A.R.
p.s. if your Cat is half dead, means you are not able to make him be healthy, probably because you make useless things to see if it works

Andrea Rossi
May 5th, 2011 at 4:16 PM

Dear William Alek:
Until I will start up the 1 MW plant in Greece, I will not release interviews: there is nothing more to say that has not been already said. Please contact me in november: at that point we will have in operation a plant that will really start our revolution.
Warm regards,
A.R.
p.s. the 3 interviews that you will see in total from now to november have been programmed months ago.

Andrea Rossi
May 5th, 2011 at 4:08 PM

Dear Mr Phillip Newell:
Interesting, but, as an expert of Seebeck effect, I must remember you that in a Seebeck thermocouple you need a differential of temperature which makes the integral of the efficiency. In our application is impossible to get enough efficiency, but it is true so far. In Physics all is pro tempore, so it will be interesting to test this path again.
Warm regards,
A.R.

Phillip Newell
May 5th, 2011 at 3:44 PM

Dear Sirs,

If thermoelectric (Seebeck effect)material was placed upon the inner stainless steel reactor the phonons (quantum units of heat) would generate electricity and still pass enough energy to heat water. The water could be used to drive a ORC generator which would give even more electricity for use and there would still be enough heat to be used for on board heating(needed in the cold of space). The electricity then could power a VASIMR or a Dual Stage Four Grid ion thruster. See ref. below recent Seebeck effect developments.

1. Justin P. Bergfield, Michelle A. Solis, Charles A. Stafford. Giant Thermoelectric Effect from Transmission Supernodes. ACS Nano, 2010; 4 (9): 5314 DOI: 10.1021/nn100490g

2. Kanishka Biswas, Jiaqing He, Qichun Zhang, Guoyu Wang, Ctirad Uher, Vinayak P. Dravid, Mercouri G. Kanatzidis. Strained endotaxial nanostructures with high thermoelectric figure of merit. Nature Chemistry, 2011; DOI: 10.1038/nchem.955

3. E. M. Levin, B. A. Cook, J. L. Harringa, S. L. Bud'ko, R. Venkatasubramanian, K. Schmidt-Rohr. Analysis of Ce- and Yb-Doped TAGS-85 Materials with Enhanced Thermoelectric Figure of Merit.

Once the E-Cats become available all of these applications can be explored.

Regards to All

Phil Newell

William Alek
May 5th, 2011 at 2:05 PM

I host a popular radio show called The Progressive Technology Hour carried on **http://VortexNetworkNews.com**. Would you be available for an interview?

Miles Mann

May 5th, 2011 at 10:31 AM

In your latest demo's, we see unused Ecats adjacent to the operational unit. If your goal was to prove the anomalous generation of heat, why didn't you prepare one of the spares as a control unit? You could prepare identically to the test unit, but fill it with nitrogen instead of hydrogen. Ideally, you would prepare both devices in the exact same fashion, then let an impartial observer choose which one to fill with hydrogen. Then log results from the control and test unit for the duration of the demonstration. This would go a long way toward dispelling criticisms of the heat measurement methodology.

Lou Tengzelius
May 5th, 2011 at 5:44 AM

Your E-Cat can be considered as a closed system operating in a temperature controlled environment. If 5 gm. of reactive contents were sealed in small steel modules and loaded into pressurized boilers, they would serve as an energy source. By lease and recycle of modules you control and protect your intellectual property. Born in 1930, I lived through an era of spectacular steam innovations.

Marco Barin
May 5th, 2011 at 5:34 AM

Dear Dr. Rossi, I heard your interview on Radio24 and your skeptical answer about the possibility to install your reactor on motor vehicles, due to lack of readiness to output the necessary energy when required. Do you think an onboard reactor could be possibly used to charge batteries with rapid charging time and very large maximum power outputs (flywheel energy storage batteries, etc)?

Do you think your reactor – if successful and under license or other – could be easily improved by the wide world community of scientists and industries and generate unthinkable spin-off applications, or it will strictly remain – for the near future – under the development roadmap of your industry?

How much could be the purchase price of your reactor if applied to a medium-size single residential unit to produce electricity, heat, air conditioning etc?

Good luck for your hard work

Jarek
May 5th, 2011 at 3:54 AM

Dear Ivan Mellen,
Wouldn't be there essential problem with draining thermal energy out of the spaceship using current electric power generation (closed water circuit)?
Maybe there is some direct way to produce electricity – for example construct reactor shielding such that beta radiation can go through its inner part and is mainly captured by more external electrodes – these electrons have to get back to water through the inner shielding – creating charge flow.
Such reactor could be also used directly as space propulsion system using created high energy electrons(and gammas) – in opposite to the rest, just make one side of reactor transparent to beta radiation.
Regards

luigi
May 5th, 2011 at 12:24 AM

Ieri sera Radio24 (l'unico media italiano che parla dell'E-Cat con una certa assiduità già da qualche settimana) ha mandato in onda la prima parte dell'intervista ad Andrea Rossi. Questa sera la seconda parte

Ecco il link

http://www.radio24.ilsole24ore.com/player/player.php?filename=110504-mrkilowatt.mp3

Voglio esprimerle tutta la mia solidarietà e vicinanza. Ha ragione David G.: siamo in tanti a fare il tifo per te.

Non vedo l'ora che arrivi ottobre e magari di conoscerti personalmente.

Randy
May 4th, 2011 at 8:47 PM

You should invite tech writer Jed rothwell in to observe a running catalyst. He has really supported you on many science blogs. quite the fighter even when he's way out numbered by critics.

Rossi: 6 kW E-Cat Safe Enough to Install in a Basement, Sales to Private Individuals Possible Within a Year » E-Cat World
May 4th, 2011 at 8:05 PM

[...] seems now his thinking has changed on that matter. On May 3, Rossi was asked, "Do you think that security will be able to have a 6-kw e-cat at home in the basement [...]

Joseph Fine
May 4th, 2011 at 3:33 PM

Paolo Savaris, Andrea Rossi;

Your experiments with Ni and H show a reduction of Copper, while the Energy-Catalyzer (E-Cat) shows an increase of Copper. Very interesting.

You said earlier that the amount of Cobalt increased. (That may be due to the steel walls of the container.)

You may find the opposite if you don't use Zirconium. (That is, Copper may increase instead of decrease.)

If you adjust the concentration of Zirconium, (or Zirconium Oxide) you may even find a level of Zr where the level of Copper stays nearly the same. That might not produce any energy, however.

Arata and Zhang have done work with Zirconium Oxide and nano palladium. Zirconium used with Nickel may have similar effects.

http://www.rexresearch.com/arata/arata.htm

It would be interesting if your work sheds light on where the Ytterbium comes from. Please let me know the effect of adjusting the Zirconium level on the production of Yb.

The E-Cat produces energy. Nobody but us (?) may care whether it produces Ytterbium, Copper, Cobalt et cetera. (But not Gold!)

Thanks for your help.

Joseph Fine

Matthew
May 4th, 2011 at 3:29 PM

Mr. Rossi:

I would try to make all the workings of this public as quick as possible so that anyone can make one. I personally had a friend here in Salem, Oregon who developed a very revolutionary motor, 4 cylinder but like a turbine four cylinder, and a very small motor at very high rpm produced a lot of energy. He used it in numbers of vehicles and had the hell sued out of him for "patent infringement" and the public got nothing and it completely disappeared. He will not even talk about it to this day, he would have been better to give the blue prints to Israel and let it run wild. I hope you will do this, as there is more to be had in making sure any invention such as yours does not happen than in letting it happen.

Matthew McDaniel

Andrea Rossi
May 4th, 2011 at 12:15 PM

Dear David G:
Again, Thank you.
Warm regards,
A.R.

Andrea Rossi
May 4th, 2011 at 12:13 PM

Dear Mr Rèmi André:
Thank you,
Warm regards,
A.R.

Andrea Rossi
May 4th, 2011 at 12:13 PM

Dear Dr Thomas Blakeslee:
Well done.
Warm regards,
A.R.

Thomas Blakeslee
May 4th, 2011 at 11:39 AM

Dear Dr Rossi,
I've just published an article describing your work in the context of the cold fusion fiasco in 1989. I hope I got it right.

http://www.renewableenergyworld.com/rea/blog/post/2011/05/swedish-skeptics-confirm-nuclear-process-in-tiny-4-7-kw-reactor

Rémi André
May 4th, 2011 at 10:47 AM

Dear Mr Rossi

As you need some moral sustain let me tell you how much I and all the people I informed of your current work are behind you. In fact I think if all people on this planet knew what you are doing you'll have the whole mankind

behind you (maybe we should except the richest ones…). Keep confidence !

We wish you the best !!!

savaris paolo
May 4th, 2011 at 10:03 AM

Joseph Fine

As soon as I can, I will follow your suggestion regarding the non-use of Zirconium.
Regarding the Copper (Cu), I found in all tests a decrease in the final content of Cu.
(the reduction factor is between 1/2 and 1/50).
thank you
Bests Regards

Paolo Savaris

David G
May 4th, 2011 at 9:36 AM

Mr. Rossi

> Thank you: You cannot imagine how much in this moment I need moral sustain.

Trust me, there are a lot of people out there who are wishing you the best right now.

I am naturally a skeptic, but I am suspending that while I wait for your power plant to go online.

I really do want this to be real.

Best Regards,
David G

P.S.
I refer to you as "Mr.". Which prefix do you prefer?

Andrea Rossi
May 4th, 2011 at 8:54 AM

Caro Alessandre Cappa:
Grazie infinite,
Andrea Rossi

Alessandro Cappa
May 4th, 2011 at 7:56 AM

Egregio Dottor Rossi
Scusi se le scrivo in italiano, ma mi viene meglio il concetto che le voglio riferire.
Nel servizio di rai news 24 che ho visto in anteprima ieri, oltre ai vari commenti sulla sua invenzione (che io ritengo straordinaria)la frase più efficace è stata; ho commesso anche molti errori, ma li ho anche pagati moltissimo. Ecco questa frase sintetizza tutto il mio pensiero sulla sua figura, e la forza morale che ha messo in campo per ricostruirsi una vita, pochissimi uomini sono in grado di fare ciò che ora lei sta facendo (io non ne conosco nessuno). Spero con tutto il cuore che la nuova scoperta la ripaghi di tutto ciò che ha sofferto. In bocca al lupo
Alessandro Cappa

dr. eng. Giorgio Fontana
May 4th, 2011 at 7:08 AM

Dear Andrea:

Congratulations for your achivements and large scale production of energy.
I am not a researcher in your field, but I know that new ideas and concepts that are not mainstream, even slightly, require many hard efforts not only to be developed but also simply and honestly communicated for further development by others.
Anyway I found this 1996 paper describing nucler transmutation of nickel with light water electrolysis:

"NUCLEAR TRANSMUTATIONS IN THIN-FILM NICKEL COATINGS UNDERGOING ELECTROLYSIS"

http://newenergytimes.com/v2/library/1996/1996MileyG-NuclearTransmutations.pdf

The abstract says:

"Experiments using 1-mm plastic and glass microspheres coated with single and multilayers of thin films of various metals such as palladium and nickel, used in a packed-bed electrolytic cell (Patterson Power Cell ™ configuration), have apparently produced a variety of nuclear reaction products. The analysis of a run with 650-Å film of Ni is presented here. Following a two-week electrolytic run, the Ni film was found to contain Fe, Ag, Cu, Mg, and Cr, in concentrations exceeding 2 atom % each, plus a number of additional trace elements. These elements were at the most, only present in the initial film and the electrolyte plus other accessible cell components in much smaller amounts. That fact, combined with other data, such as deviations from natural isotope abundances, seemingly eliminates the alternate explanation of impurities concentrating in the film."

Therefore the basic process is experimentally well known since 1996 (maybe even before that date).

-Congratulations: for your hard job of converting those small experiments into a commercial product.

-Surprise and sadness: for all those that went near a conclusion and were not able to achieve it.
-Shame: for all those that "induced" the above mentioned surprise by cutting research funds…

Andrea Rossi
May 4th, 2011 at 5:06 AM

Dear Luke Mortensen:
1- up to now we have in operation 170 modules of the 300 that will compound the 1 MW plant.
2- Thank you: You cannot imagine how much in this moment I need moral sustain.
Warm regards,
A.R.

Luke Mortensen
May 4th, 2011 at 3:29 AM

AR,

How many reactors are we up to?
What percentage of the required reactors for the 1MW is this? It's good to hear about your progress in the factory.

Thanks for continuing the short periodic demos. Letting the skeptics "kick the tires" is good PR for the ecat and hopefully won't keep you out of the lab/factory too much.

Best,
Luke

Andrea Rossi
May 4th, 2011 at 1:05 AM

Dear Mr Ivan Mellen:
Thank you for your glance in the future possible applications: for now I am earthly attached to the present necessity to arrive with a good 1 MW plant in October, to make heat.

Maybe your previsions are right.
About your questions:
a- the temp inside the reactor reached the 1,600 °C
b- yes
Warm Regards,
A.R.

Ivan Mellen
May 3rd, 2011 at 6:49 PM

Mr. Rossi,

I'm following your progress for few months and I wish you the best. I'm sure this is the most exciting part of your life

At this time, I see that the main focus is on the industrial and residential heat/electricity production. However,in longer term it might have huge impact on the space explorarion. A few thoughts:

1. Propulsion: replace rocket fuel + combustion with water + steam generation by your reactor
Reactor can work much closer to its critical power to achieve better power to weight ratio. It does not have to work safely for years only for few minutes. Safety is not that critical – reactor explosion will rip tank of water – negligible, when compared with liquid fuel rocket explosion. Also, water tank for steam rocket is order of magnitude simpler and safer than cryotanks for liquid hydrogen ond oxygen.

2. Electrical power:generate electrical power for space mision beyond Mars orbit
At these distance, sun power is not sufficient, nuclear power with all its disadvantages is the only current option. Abundant power generated by the LENR reactor can allow more power demanding scientific payload and stronger transmitter.

3. Heat: generate heat to keep systems working
It is not very well known that space probes has to be heated to keep electronics functional. No more need for plutionium heaters.

4. Deep space propulsion (for example ion thrusters that are power limited)
Active propulsion significantly shortens time to reach the destination. Now we have to wait for few years to reach remote edges of the solar system.

Nickel and water ice are frequently found in the solar systems (Ni-Fe asteroids, comets, moons) so this form of propulsion has bright future.

I have two questions:
a) How close to the nickel melting point (1455 C) can reactor temperature be? (This is important for rocket engine efficiency.)
b) If output power is significantly reduced, is refueling period extended proportionally? (This has impact on the long term system heating.)

Regards,

Ivan Mellen
Calgary

Andrea Rossi
May 3rd, 2011 at 3:19 PM

Dear Mr Johan Gustafson:
1- The smallest module can be 2,5 kW, so far
2- as above
3- Yes.
Warm regards,
A.R.

Johan Gustafson
May 3rd, 2011 at 2:55 PM

Dear Dr. Rossi
Been thinking a bit on the e-cat rules capability.
1st How quickly you can settle down from the example 6kW output to 1 kW?
2nd How far down can reduce the effect of a 6kW – machine?
3rd Do you think that security will be able to have a 6-kw e-cat at home in the basement connected to the heating system?

Warm Greetings
J Gustafson

Andrea Rossi
May 3rd, 2011 at 5:13 AM

Dear Mr Mirco Romanato:
1- putting them in series, yes
2- Only hot water
Warm regards,
A.R.

Andrea Rossi
May 3rd, 2011 at 5:11 AM

Dear Mr Fabio Sanzani:
Thank you for the suggestion. Bought the product, today I test it.
Warm Regards,
A.R.

fabiosanzani
May 2nd, 2011 at 3:09 PM

Buonasera Ing. Rossi
Ho visto le ultime sue dimostrazioni x Nyteknik. Le vorrei suggerire per l'isolamento delle tubazioni il prodotto tipo Aerogel (schede tecniche reperibili in rete), in poco spessore ha le migliori caratteristiche di isolamento e quindi le potrebbe essere utile per rendere compatto il sistema in configurazione as built. Mi scuso se passo al pratico e non voglio insegnare niente a nessuno.
Fabio Sanzani

Mirco Romanato
May 2nd, 2011 at 2:40 PM

Dr. Rossi, I have a few questions for you:
1) are the e-cats you are building able or expected to produce high pressure steam?

gli e-cat che sta costruendo sono capaci o destinati a produrre vapore ad alta pressione?

2) the 1 MW plant you will deliver in October will be used to produce only hot water/steam or electricity also?
L'impianto da 1 MW che consegnerà ad Ottobre sarà usato per produrre solo acqua calda/vapore oppure anche elettricità?

I miei migliori auguri di successo.

Andrea Rossi
May 2nd, 2011 at 1:54 AM

Dear Doug Hulstedt, MD:
1- I prefer a simpler and more specific way: get the address of the children, make a check that all is true, pay the hospital, get the specific healthcare. I think this is the only way to be effective in a practical way, otherwise money will be diluted in many ways and, substantially, wasted.
2- I have good help
Waerm regards,
A.R.

Andrea Rossi
May 2nd, 2011 at 1:49 AM

Dear Dr Joseph Fine:
Thank you, interesting.
Warm regards,
A.R.

Doug Hulstedt MD
May 1st, 2011 at 11:41 PM

Dear Dr. Rossi,
regarding specific treatments
There are modalities which help free autistic Kids from Brain fog and there are grass roots organizations already in place so donations could be funneled to families for treatment. Insurances don't pay for most of the modalities that have huge bang for the buck for these kids. Low pressure Hyperbaric oxygen is one modality which seems to consistently work for kids but has no insurance compensation. There is also extensive metabolic testing that gives good direction to treating specialists. It is also not covered by most insurances. Autism incidence has taken a tremendous leap in the world and actually your invention may begin to alleviate a portion of the causes of autism. Coal powered energy plants spew mercury into the air and surrounding countryside and there is correlation particularly in the state of Texas and proximity to coal powerplants with autism incidence. Two grassroots organizations which already have grants and scholarship programs in place are TACA (talk about curing autism) and Generation Rescue. I will call them tomorrow for further data.
As an aside You want specific routes of donation. The biggest bang for the buck is always prevention in disease and health. Three basic necessities are: air, food and water. The water supply sucks eggs in huge portions of the world and there are organizations which supply clean water wells for communities in indigenous areas. This would have a huge impact on infant and child mortality. Please also realize the biggest health improvement of the last 100 years has been the implementation of hygiene in populations.
How many of the handmade Ecats can you make per day?
Blessings
Doug Hulstedt MD

Joseph Fine
May 1st, 2011 at 9:15 PM

Dr. Rossi,

The following link is from the New York Times. (Someday soon, God willing, the NY Times will reference the

Journal-of-Nuclear Physics.) The link points to a software application (or 'app') demonstrating Newton's Cradle.

http://wordplay.blogs.nytimes.com/2010/12/06/numberplay-newtons-cradle/

I'm including the link because the cradle may represent a set of 'nucleons'. (It is also fun to use the app.) It suggests a mechanism I overlooked. That is, the 'Cradle' could represent a (one-dimensional version) of a large number of mini-atoms, hypoles, neutroids or 'masked' protons/alphas that collide with a nucleus (e.g. of Nickel). With a bit of manipulation of the mouse button, it is possible to get the two end 'mini-atoms' to hit the 'nucleus' from the left and right ends at nearly the same time.

A nucleus has ("at least") three dimensions. Instead of one mini-atom interacting with the nucleus, multiple collisions with the nucleus probably occur with near simultaneity – from different azimuths and elevations. That is, if there are enough interactions/impacts on nuclei from a large number of mini-atoms (at the right energy or 'temperature'), one or more of the 'masked' protons may be in the right place at the right time to merge with the nucleus.

"Ad astra per aspera." More appropriately, "If at first you don't succeed, try try again."

I suspect the math is slightly more complex.

J.F.

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