



Sadi Carnot

The father of thermodynamic, Sadi Carnot, got his name after great Persian poet Sadi Musharifudin, who lived about 900 years ago.

Here are his verses:

*“Long will, alas, without us flowers blossom
Long will without us spring bloom
Again there will be May, July, January
While us only dust and earth will burry,
The endless number of people yet to be born
Will peacefully on our dust walk.”*

The most recent collaboration activity of ZRG- Zagreb/Rome University Group has been unquestionably his most painful and sorrowful: Sonja Koščak - Kolin and me prepared this booklet, aimed at summarizing the rich and serene life of Ivo Kolin. Very hard task.

The reader will find some essential information, inadequate to give even a general idea of such a creative, imaginative and profound scientist.

Rarely scientific rigour and knowledge have been coupled in a man with an extraordinary imagination and creativity as it was in Ivo.

Additionally, perhaps as a consequence, Ivo had the rare gift of a very striking curiosity to analyze and investigate, then transforming his conclusions in ingenious and brilliant applications, such as new energy systems and innovative engines or mathematical and physical laws. His interest on the history of Thermodynamics and its technological evolution was unique as the painstaking reconstruction of all the most significant discoveries and patents in the field.

According to an old saying, a man is a *young man* till he is aimed at changing and improving the world; is an *old man* at the very moment he discovers that the world has changed him, stealing such a yearning. In the case of Ivo we can easily acknowledge that, despite his age, he died being young men, absolutely young.

Vincenzo NASO

BIOGRAPHY

Ivo Kolin was born in Zagreb on September 23rd, 1924 and finished the Nautical Academy in Dubrovnik in 1944. He graduated from the Faculty of Economy in 1949 and from the Faculty of Mechanical Engineering and Naval Architecture in 1955, both at the University of Zagreb. His first employment was at the factory 'Ventilator' in Zagreb, where he worked as a design engineer. He held two doctoral degrees, the first one in Technical Sciences was awarded in 1972 from the University of Zagreb - Faculty of Technology. His second Ph. D. degree was from the University of Sarajevo - Faculty of Economy, received in 1975 for investigating the production and investment costs of the nuclear power-plants.

Ivo Kolin started his scientific career as an Assistant Professor at the Faculty of Technology in Zagreb, and later on was a Full Professor at the Faculty of Mining, Geology and Petroleum Engineering. He retired as *Professor emeritus* from the Department of Petroleum Engineering.

His first two books were 'Thermodynamics Atlas I' (1967) and 'Evolution of the heat engines' (1973), both published by Longman, London. The second book was reprinted in 1998 by Morya-Press (USA). As he was researching the evolution of heat engines, he designed and built a collection of 54 heat engine models based on the original drawings. This unique collection is now permanently exhibited at the Technical Museum in Zagreb.

His research on the Stirling thermodynamic cycle resulted in the invention of Stirling motor with flat plate heat exchangers. This new thermodynamic concept enables utilization of the moderate temperature renewable energies readily available, like the solar heat, geothermal hot water or the industrial waste heat. He described his new principle in two books on Stirling engines, published by the University of Zagreb in 1983 and 1991.

Croatian government awarded him the State Award for Science in 1997. He also received several international Awards for his pioneering work on the Stirling engine: Rome (1986), Monterey (1987) and Tokyo (1988, 1995 and 1997). As a visiting professor he gave numerous lectures in Austria, Canada, Italy, Japan, Malta, Morocco, Germany, Norway, Switzerland and The Netherlands. His most successful collaboration was with the University of Rome 'La Sapienza', where he taught regularly post-graduate courses from 1987 to 2001.

Ivo Kolin mentored many students - 40 for Bachelor's, 30 for Master's and 11 for Doctoral degree thesis. He was also a member of numerous dissertation Committees in Croatia and abroad.

Ivo Kolin passed away in January 2007, shortly after publishing his fifth book 'Energy and Gross National Product'.

Zagreb, 24th January 2007

Relation of a man towards nature, observing of all those multiple threads that with rich variousity tie mutual expectations, thinking about sense and purpose of life have been basic questions and determinations of our professor Kolin which himself, by his truly peculiar passion, has been looking for general answers.

Erudite by vocation, double doctor of science, professor Kolin has been at the same time scientist, artist, thinker that will be durably marked in science, but above all in our hearts. His brilliant intellect has not been satisfied only with passive acceptance of impressions from outer world but he has been sinking in the depth looking for scientific truth. Besides exceptional scopes in thermodynamics he has been studying with the same interest philosophers, writers, artists, scientists who during centuries arranged in a row creation of their intellect in one endless suite.

People, he said, are mostly dreamers or practitioners. To ones thoughts are more revolving to the World, as it should be, while the others hardly separate from the World existing in reality. But for us, who have lived near him, we have understood that professor Kolin has been both. His both basic and living attitudes complete mutually. We have learned from him, that looking for truth in the past it is possible to determine ways for future.

Therefore our professor Kolin has been intellectual for all periods from which permanence has been breaking out in resolving life puzzles as well as scientist or a friend. Therefore his work for us associates and followers and numerous generations of students will be open forever.

Once, long ago paraphrasing one known thought I wrote to professor Kolin:

It is always spoken about originality, but what does it mean?

When we are born the World begins to influence us.

And it goes to the end. Everywhere.

But what beside our own energy and will in hitherto prevailing work may be called truly ours?

If this can be said by words, just everything that we owe to our dear professor and friend Ivo Kolin, it would not be left a lot.

THEREFORE MAY HE REST IN PEACE!

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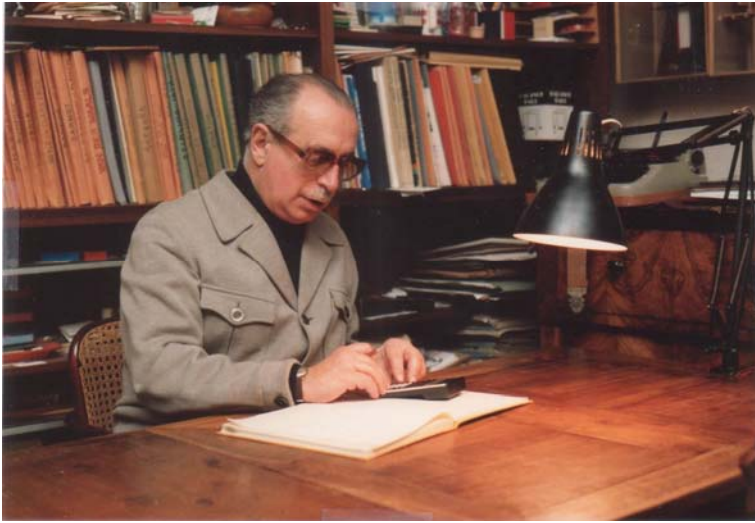
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1. **THERMODYNAMICS ATLAS 1**, Longmans, London, 1967, p. 37
2. **THE EVOLUTION OF THE HEAT ENGINES**, Longmans, London, 1972, p. 105
3. **ISOTHERMAL STIRLING CYCLE ENGINE**, Zagreb University Publication, Zagreb, 1983, p.187
4. **STIRLING MOTOR history - theory – practice**, Zagreb University Publication, Dubrovnik, 1991, p. 285
5. **THE EVOLUTION OF THE HEAT ENGINES**, The Second Edition, Morya Press, USA, 1998, p. 106
6. **ENERGY & GROSS NATIONAL PRODUCT**, Tiskara Domagoj, Zagreb, Croatia, 2006, p. 78

MEMORY PHOTO GALLERY



Prof. Ivo Kolin designing models of the first thermodynamic engines.



His collaborators at work.

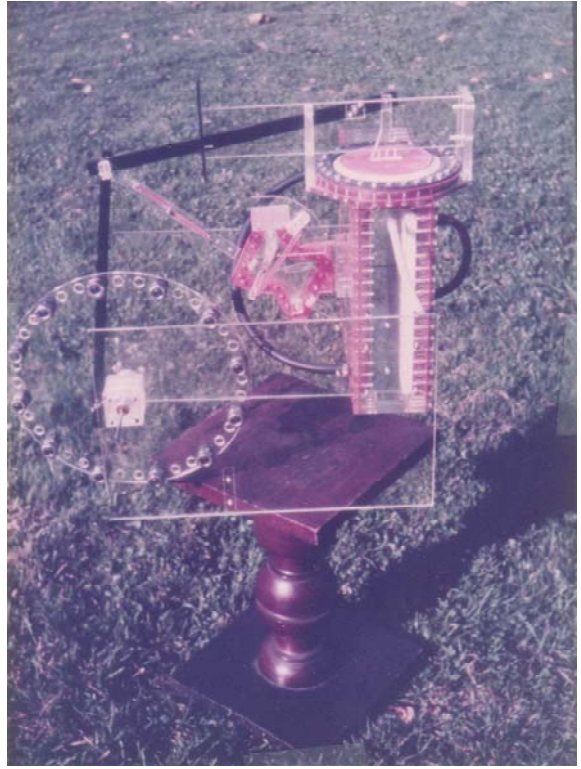
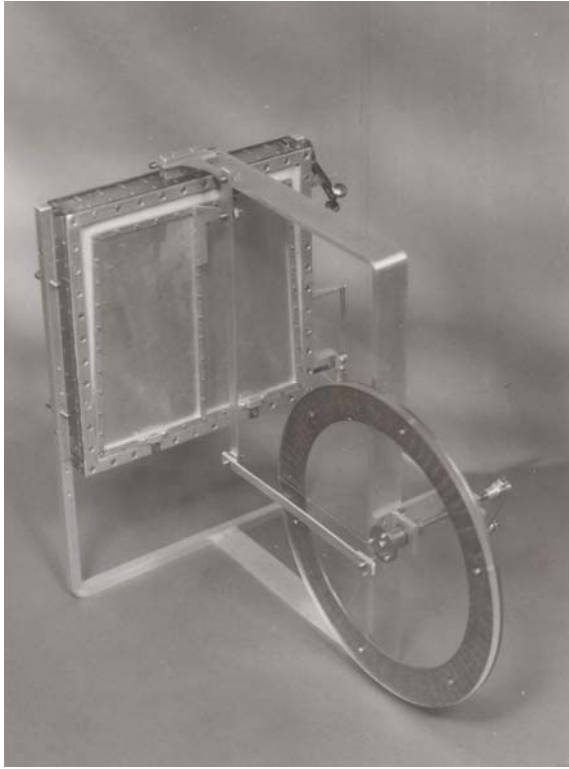


A model "tested" by Ivo and Vlasta Kolin.

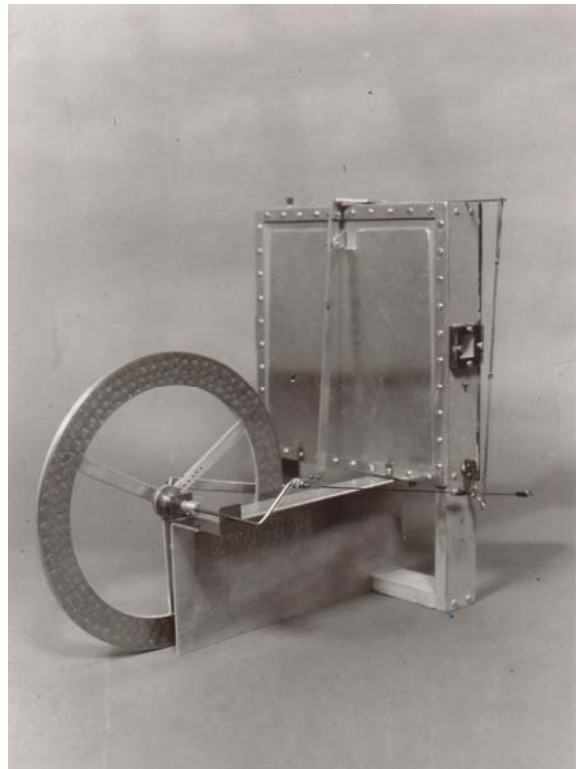
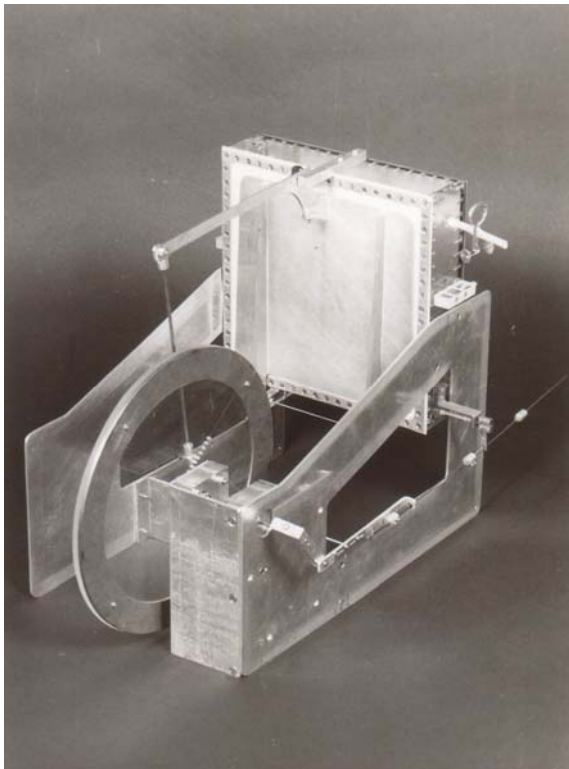


**The Kolin's engine
(so-called "Low Delta-T engine")
showed and discussed
at Dubrovnik Conference in 1983.**





Some versions of Kolin engine.





Ivo Kolin device gathering sea wave energy.
Field Tests in Kuciste (Croatia).



Ivo Kolin The evolution of the heat engine

Thermodynamics Atlas 2





Ivo Kolin prepared table for Sonja birthday.



Ivo and Sonja on the hill above Zagreb in October.



Ivo Kolin birthday on 23rd September 2006.



Promotion of 'Jedrenjaci' at Orebic.

