

# Remembering N N Bogoliubov

Physicist and Mathematician

Dmitry Shirkov

# Bogoliubov 1909 – 1992



Nikolaj Nikolaevich  
Bogoliubov started  
scientific activity  
at his 15

In 1930 (photo) he  
got the Doctor degree

I worked with him since  
1949 ...

# Lecture Plan

- Early impression 1947-1950
- Sarov 1950-1953
- Bogoliubov and Lavrentiev

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- Bogoliubov and Landau
- Features of Creativity
- Teacher

# Early impression, FizFak 1947

My first impression dates back to the spring of 1947 when N.N. read a special course of lectures on "Dynamic equations of statistical physics".

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Since winter 1948/49 I worked with NN in Institute for Chemical Phys (=ICT) on Soviet Atomic Project.

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In Amer. Davison '65 book **both the "Atomic Energy" papers**  
-> formed Chapter "Shirkov method"

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\* After Seminar all the company led by NN visited "Ararat" shop : glass of Cognac with lemon;

NN comings and departures – **feasts in restaurants !**

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This led to change in the life-values scale – intellectual activity not moved to 1st place, it took top priority.

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After contacting with many eminent scientists for 50 years passed, I say – impression of N.N.'s intellectual and moral exclusiveness has only enhanced.

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After lunch NN.- 40(!) years old then had a customary 1-hour rest, "washing the brains", as he called it: in the evening he was able to have the "2nd working day".



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Besides some others, the NN group comprised Zubarev (plasma) and Vladimirov (computing). Bogoluibow spent at Sarov ca 1/2 of his time. He worked on the hydrogen Sakharov “”, as well as on the Tokamak prototype proposed by Tamm and Sakharov.

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N.N. escaped abundant words. The rule "First think, and then speak" (paraphrase of the Dirac's remark In my childhood, my mother taught me first to think and then to write" to Bohr) is fully applicable to him.

Analogous person was Juli Khariton. He could take a 1-week pause before answering. NN invented new verb – “to kharitonize”.

# Features of Bogoliubov's creativity, 50s

1. Tomonaga-Schwinger equation with area function (4) 1950-1952
2. Plasma in magnetic field (8) 1951-1952
3. Functional integral representation (1) 1954
4. Causality condition and scattering matrix (3) 1955-1956
5. Multiplication of singular functions and R operation (5) 1955-1957
6. Renormalization group (4) 1955-1956
7. Physical dispersion relations (3) 1956-1957
8. Subtleties of proving DRs (7) 1956-1958
9. Superconductivity for Frohlich model (4) 1957-1958
10. Model Hamiltonians and pair correlations (4) 1959-1960
11. Indefinite metric in QFT (2) 1958
12. Quasi-averages (2) 1960-1961

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Creative style – "Veni, vidi, vici". He addressed to the problem, exhaustively solved it, and switched to another problem.

. Cf., e.g., with Heisenberg and Landau.

# The Teacher

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\*\* 2nd element = involvement of a young colleague  
into a large activity such as joint work on a book.

\*\*\* 3rd method of cultivating self-dependence →  
accelerated training of the young co-author in the art  
of reporting on joint research –

“To put on the wing without delay”

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NN was interested in personal qualities of young people around him. He valued the congenial human environment, the moral climate among his co-workers. Bogoliubov moral lessons were learnt not from his reprimands but from his behavior and way of action

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The Bogoluibov moral heritage became apparent in a complicated post-Soviet period. Unlike many others, the Bogoliubov followers served and will continue serving their Motherland. Thanks to them the Spirit of Nikolai Nikolaevich is still among us.