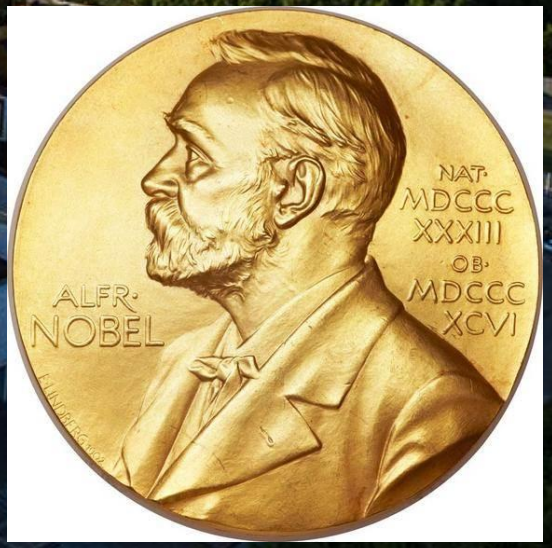
The Nobel Prize Winners – members of the Russian Academy of Sciences



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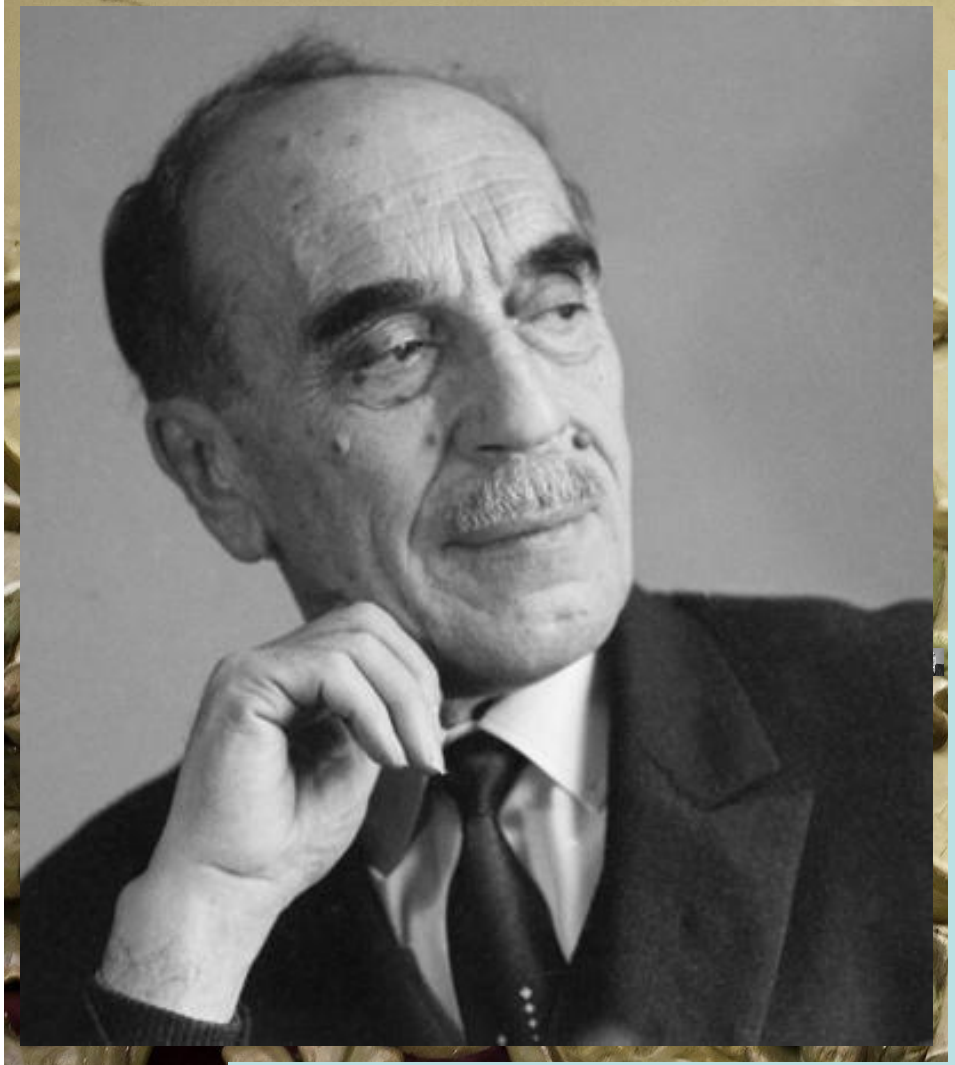
The Russian Academy of Sciences (RAS)
is one of the leading research organizations in the world and the largest centre for fundamental research in Russia. With the use of government funding, the scientific institutions of the academic system carry out fundamental and applied scientific research in the areas of natural, technical, humanitarian and social sciences.

Because of its long history of supporting scientific research and education, Russia has produced a number of internationally recognized leaders in physics and chemistry.

The Russian Academy of Sciences played a major part in all their careers. With one exception, all were members of the Academy, carrying out their research and publishing their findings with the Academy's support.

Useful vocabulary:
- ***research*** – исследования
- ***government funding*** – правительственное финансирование
- ***to carry out applied scientific research*** – выполнять прикладные научные исследования
- ***to support*** – поддерживать
- ***internationally recognized leaders*** – ведущие учёные, признанные на мировом уровне
- ***to publish the findings*** – публиковать открытия



Nikolay Semyonov

In 1956, Nikolay N. Semyonov was the first Russian to receive a Nobel Prize for Chemistry for his research into the mechanism of chemical reactions.
He was trained as a physicist and chemist. During his career, working alone or with other distinguished scientists, he made many important discoveries and contributions to chemistry and physics.
In 1931, Semyonov became the first director of the Institute of Chemical Physics of the Academy and was also one of the founders of the Moscow Institute of Physics and Technology (MIPT).

Useful vocabulary:

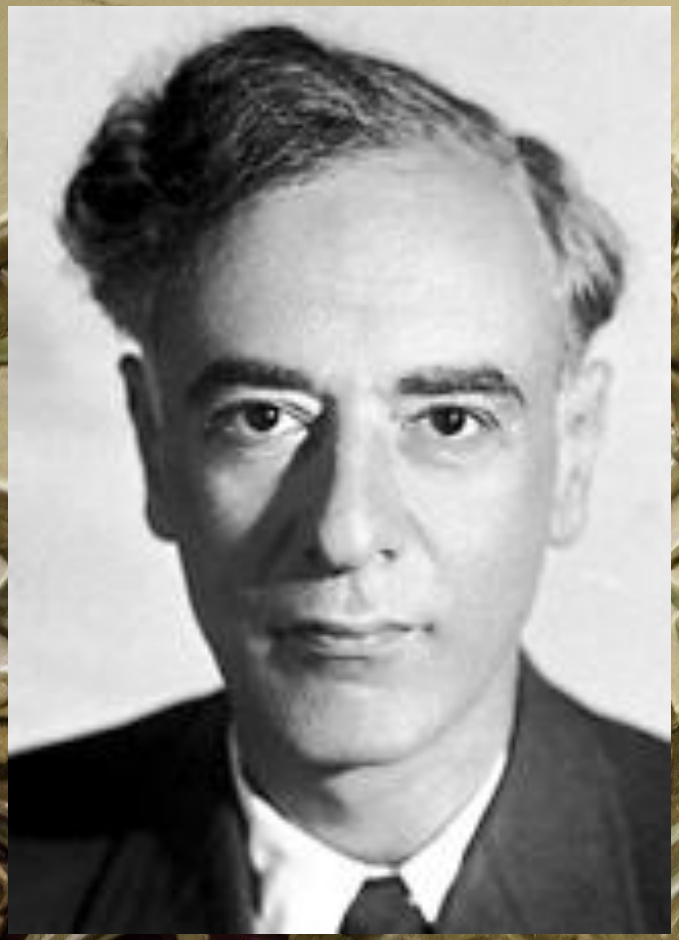
- **to receive a Nobel Prize** – получить Нобелевскую премию
- **distinguished scientists** – выдающиеся учёные
- **discoveries and contributions** – открытия и достижения
- **founder** – основатель



The collaboration of Pavel A. Cherenkov, Igor Y. Tamm and Ilya M. Frank resulted in the discovery and description of the Cherenkov-Vavilov effect, a phenomenon which is very important in nuclear physics. For their work they received the Nobel Prize in 1958. All three of the scientists were professors at universities and the Academy's institutes and greatly influenced future generations of scientists.

Useful vocabulary:

- **collaboration** – сотрудничество
- **description; to describe** – описание; описывать
- **nuclear physics** – ядерная физика
- **to influence future generations of scientists** – повлиять на будущие поколения учёных



Lev D. Landau

After receiving his doctoral degree from Leningrad University at the exceptionally young age of 19, Lev D. Landau went on to study abroad. When he returned to Russia, he became head of two of the Academy's institutes.

Like Semyonov, he was also involved in founding the MIPT. He received the Nobel Prize for Physics in 1962, for his phenomenological theory of superfluidity in helium.

Useful vocabulary:

- **to go on to study abroad** – продолжать обучение за границей
- **to return to Russia** – вернуться в Россию
- **he was involved in …** – он принимал участие в …
- **to found; founder** – основывать (институт); основатель
- **superfluidity in helium** – сверхтекучесть гелия

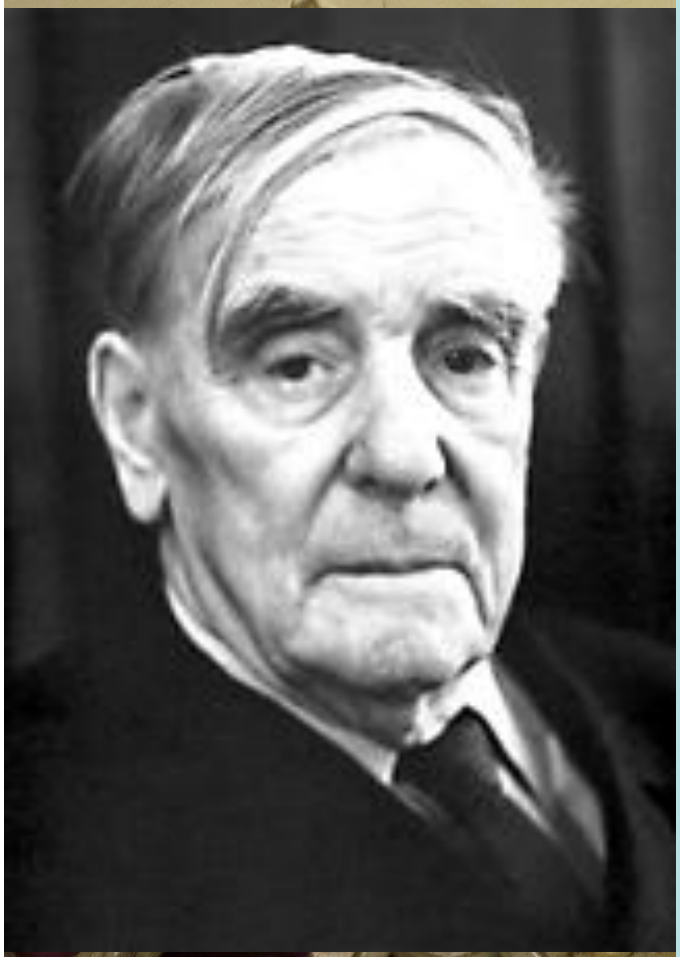
Nikolay Basov and Aleksandr Prokhorov

Nikolay G. Basov and Aleksandr M. Prokhorov worked together on a project which led to the development of the laser and their receiving the 1964 Nobel Prize. Both worked at the Lebedev Institute of Physics (Basov was the Director from 1973-1988) and also taught at universities. Even though Prokhorov never became a member of the Academy, the Academy's General Physics Institute was renamed the A.M. Prokhorov General Physics Institute in his honour.

Useful vocabulary:

- **to work on a project** – работать над проектом
- **to lead to the development** – приводить к развитию
- **to teach (taught)** – преподавать; обучать
- **the Institute was renamed** – институт был переименован
- **in his honour** – в его честь

Pyotr L. Kapitsa



Pyotr L. Kapitsa went to England after he had completed his studies at Petrograd Polytechnic Institute. He studied at Cambridge and worked on various projects there. He returned to Russia in 1934 and continued his career there.
He was one of the founders of the MIPT.
In addition, Kapitsa was a member of the Soviet National Committee of the Pugwash movement, a group of scientists who wanted to use science for the good of humankind and not for violence and war.
Kapitsa won the Nobel Prize for Physics in 1978, for his work on low-temperature physics.

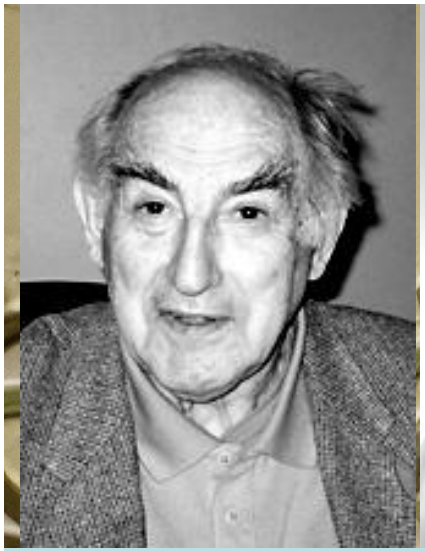
Useful vocabulary:

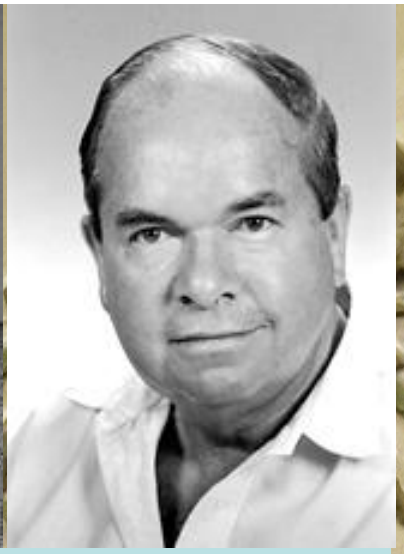
- **to complete the studies** – заканчивать обучение
- **various** – различный
- **for the good of humankind** – на благо человечества
- **violence** – насилие

Zhores I. Alferov

Zhores I. Alferov is a Soviet and Russian physicist and academic who contributed to the creation of modern heterostructure physics and electronics.
He is the winner of 2000 Nobel Prize in Physics. His contributions to physics and technology of semiconductor heterostructures, development of lasers, solar cells, and epitaxy processes have led to the creation of modern heterostructure physics and electronics.
He has been a member of the Russian State Parliament, the Duma, since 1995.

Useful vocabulary:
- **to contribute to…; contribution (to)** – внести вклад во что-л.; достижение
- **to create; creation** – создать; создание
- **heterostructure physics** – физика гетероструктур *(слоистая структура из различных полупроводников)*
- **semiconductor** – полупроводник *(кристаллический материал, который проводит электричество)*
- **solar cells** – солнечные элементы; фотоэлементы
- **epitaxy** – эпитаксия *(выращивание одного кристалла на поверхности другого)*





Vitaly Ginzburg and Aleksei Abrikosov

Ginzburg V.L. is a Soviet theoretical physicist, astrophysicist, Nobel laureate in 2003, a member of the Russian Academy of Sciences and one of the fathers of Soviet hydrogen bomb. He was the successor to Igor Tamm as head of the Department of Theoretical Physics of the Academy's physics institute. Ginzburg is the author of several hundred papers and a dozen books devoted to physics and astrophysics.

Abrikosov A.A. is a Soviet and Russian theoretical physicist, Nobel Prize winner in 2003, whose main contributions are in the field of condensed matter physics. Abrikosov discovered the way in which magnetic flux can penetrate a superconductor.

Useful vocabulary:

- **hydrogen bomb** – водородная бомба
- **successor to…** – преемник
- **department** – кафедра
- **devoted to…** – посвящённый …
- **the field of condensed matter physics** – область физики плотных (конденсированных) сред
- **to discover the way** – открыть способ
- **magnetic flux** – поток магнитной индукции
- **to penetrate a superconductor** – проникнуть в сверхпроводник (сверхпроводниковый материал)

TASK 1. Complete the sentences using the words in the box.

a) astrophysics; b) development; c) technical; d) superfluidity;
e) chemistry; f) nuclear physics; g) low-temperature; h) contributed to

1) The RAS supports researches and publishing the findings of scientists working in the areas of natural, _____, humanitarian and social sciences.

2) The first Russian scientist to receive a Nobel Prize for _____ was Nikolay Semyonov.

3) The discovery and description of the Cherenkov-Vavilov effect is very important in _____.

4) Lev Landau is famous for developing his phenomenological theory of _____ in helium.

5) The project of N. Basov and A. Prokhorov led to the _____ of the laser.

6) Pyotr Kapitsa won the Nobel Prize for Physics in 1978, for his work on _____ physics.

7) Z. Alferov _____ physics and technology of semiconductor heterostructures, development of lasers, and solar cells.

8) V. Ginzburg's books are devoted mostly to physics and _____ .

TASK 2. **Match the English terms with their Russian equivalents.**

1) applied research
2) important discovery
3) collaboration
4) superfluidity
5) distinguished contributions
6) for the good of humankind
7) creation
8) semiconductor
9) condensed matter physics
10) devoted to physics
11) magnetic flux
12) hydrogen bomb

a) на благо человечества
b) полупроводник
c) прикладное исследование
d) посвящённый физике
e) создание
f) водородная бомба
g) важное открытие
h) магнитная индукция
i) выдающиеся достижения
j) сотрудничество
k) сверхтекучесть
l) физика плотных сред

TASK 3. Complete the sentences using the correct prepositions.

to in during to for at of for into in

1) The Russian Academy of Sciences is the largest centre _____ fundamental research in Russia.

2) Our country has produced a lot of internationally recognized leaders _____ physics and chemistry.

3) Nikolay Semyonov carried out his research _____ the mechanism of chemical reactions.

4) _____ his career, he made many important discoveries and contributions to chemistry and physics.

5) The collaboration of these scientists resulted _____ the discovery and description of the phenomenon important in nuclear physics.

6) The scientists were professors _____ universities and the Academy's institutes.

7) This project which led _____ the development of the laser.

8) They didn't want to use science _____ violence and war.

9) V. Ginzburg was the successor _____ Igor Tamm.

10) Z. Alferov contributed to the creation _____ modern heterostructure physics and electronics.

TASK 4. Make the phrases matching the verbs with nouns. Translate them into Russian.

1) to describe	a) the institute in his honour
2) to carry out	b) a superconductor
3) to contribute to	c) findings
4) to receive	d) the books to physics
5) to work on	e) a phenomenon
6) to publish	f) future generations
7) to rename	g) founding the institute
8) to devote	h) his native country
9) to be involved in	i) the creation of physics
10) to penetrate	j) scientific researches
11) to influence	k) a project
12) to return to	l) a Nobel Prize

TASK 5. ***Translate the following sentences into English using the phrases from Task 4.***

1) *Комиссия рекомендует переименовать институт в честь выдающегося учёного.*
2) *Учёные получают нобелевскую премию за важные научные исследования, крупный вклад в культуру или развитие общества.*
3) *Эти четыре книги посвящены основным законам физики.*
4) *Данные открытия повлияли на будущие поколения учёных и исследователей.*
5) *«Я вернусь в свою родную страну, и мы создадим лучшую в мире науку». (Л. Ландау)*
6) *Учёные публикуют свои открытия при поддержке Российской Академии Наук.*
7) *Группа исследователей работает над важным проектом в области полупроводников.*
8) *Во время ответа на экзаменационный вопрос студент должен уметь описать данное электромагнитное явление.*
9) *Проводить научные исследования – значит получать новые знания в целях их практического применения.*