



Software and information environment tools for users of the HybriLIT platform

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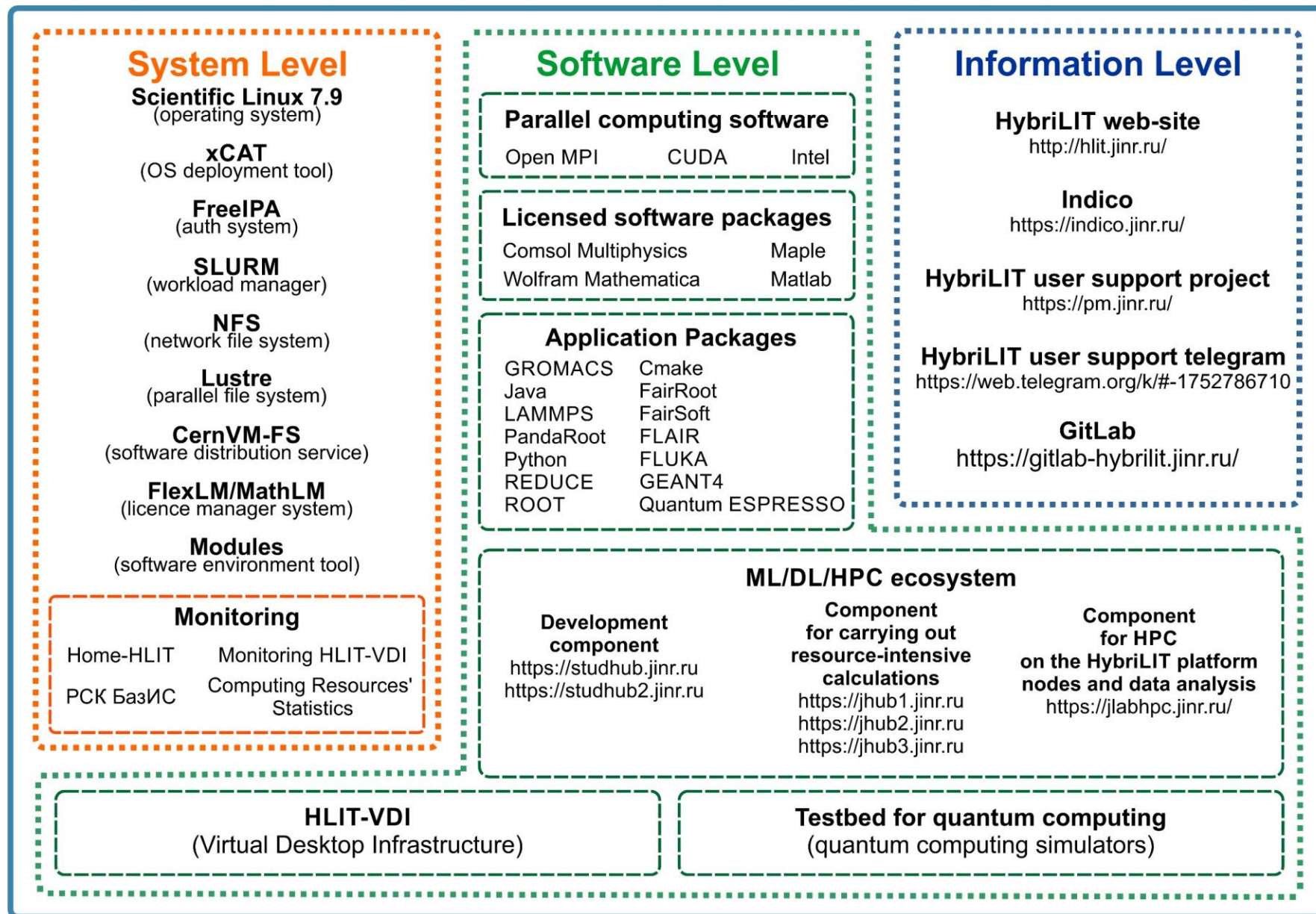
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20-25 October 2024
Yerevan, Armenia



MICC component: HybriLIT platform





GOVORUN supercomputer: services for users



PLATFORM "HYBRILIT" FOR USERS ACCESS TO RESOURCES OUR PROJECTS ABOUT US NEWS

Heterogeneous platform "HybriLIT"

Суперкомпьютер «Говорун» / учебно-тестовый полигон «HybriLIT»

SERVICES HOW TO WORK TRAINING VIDEOS

- FOR USERS
- REGISTRATION
- RULES
- HOW TO WORK
- TRAINING VIDEOS
- SERVICES
- USEFUL LINKS

Channel Info

HybriLIT: user support
131 subscribers

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HybriLIT user support

Issues

#	Tracker	Status	Priority	Subject	Assignee	Updated
9801	Поддержка	In Progress	Urgent	Перестал нормально работать пакет FLAIR	Maxim Zuev	30.09.2024 14:51
9780	Поддержка	In Progress	Urgent	Проблемы со SLURM		23.09.2024 12:40
9776	Support	New	Normal	Intel2021 buildup of OpenMPI v5 problem		08.09.2024 22:15
9775	Поддержка	New	Urgent	Пропавшие очереди?		09.09.2024 09:09
9774	Support	New	Normal	WARNING: 'aclocal-1.16' is missing on your system.		08.09.2024 01:00
9763	Ошибка	New	Normal	segfault на bltp		11.09.2024 15:23
9762	Поддержка	Resolved	High	Мониторинг задач в SLURM		05.09.2024 20:55
9760	Support	Resolved	Normal	interactive partition wanted		07.09.2024 10:05
9752	Bug	New	Normal	slurmstepd: error: *** JOB 600589 ON blade06 CANCELLED AT 2024-08-30T17:08:21 DUE TO TIME LIMIT ***		04.09.2024 20:08

Issue tracking

	open	closed	Total
Bug	11	103	114
Support	19	96	115
Ошибка	1	17	18
Улучшение	1	19	20
Поддержка	8	45	53



GOVORUN supercomputer: services for users

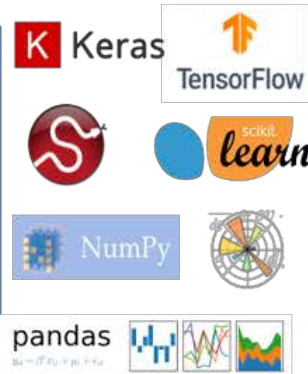


Development component

VM with JupyterHub
<https://jhub.jinr.ru>



VM:
CPU: 24 Cores
RAM: 32 GB



Computation component

Servers with
NVIDIA
Volta & Intel Xeon Gold
<https://jhub2.jinr.ru>

Dell Volta specs:

GPU: 4x Nvidia Volta V100-SXM2 NVLink 32Gb HBM2

CPU: 2x Intel(R) Xeon(R) Gold 6148 CPU @ 2.40GHz 20 Cores/40 Threads

RAM: 512 GB DDR4 2666MHz

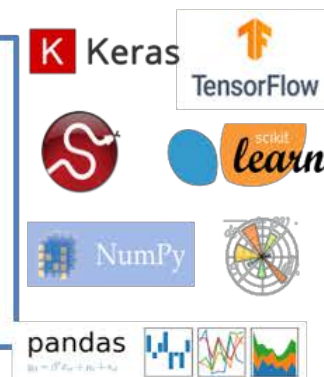
SSD: 2*240 GB

HPCLab component

VM with
JupyterHub and SLURM
<https://jlabhpc.jinr.ru/>



VM:
CPU: 24 Cores
RAM: 64 GB



High Performance Computing

The ML/DL/HPC ecosystem is now actively used for machine and deep learning tasks. At the same time, the accumulated tools and libraries can be more widely used for scientific research, including:

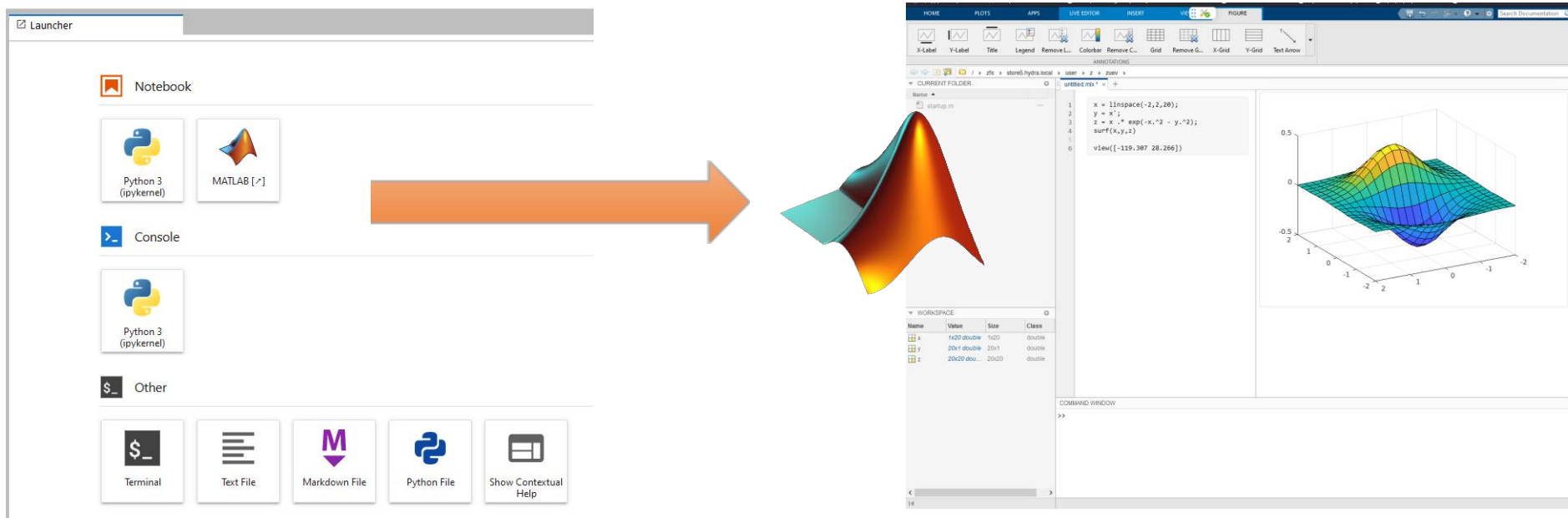
- numerical computations;
- parallel computing on CPUs and GPUs;
- visualization of results;
- accompanying them with the necessary formulas and explanations.

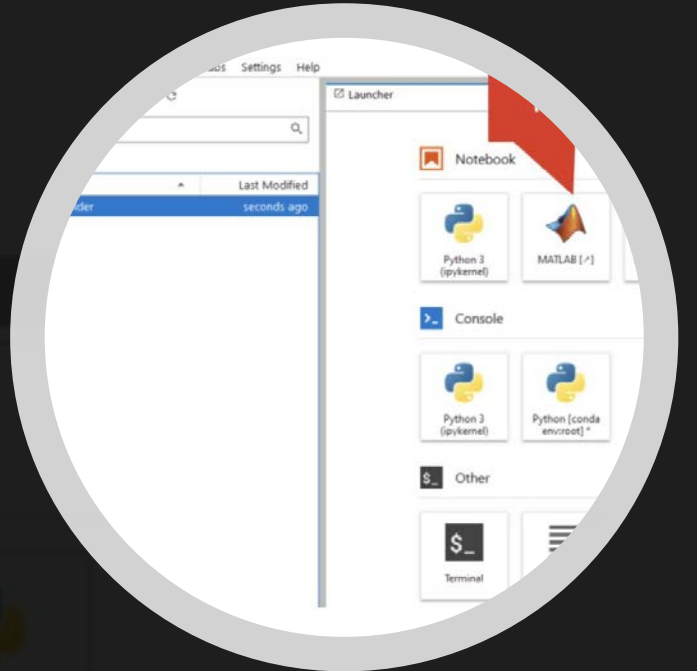
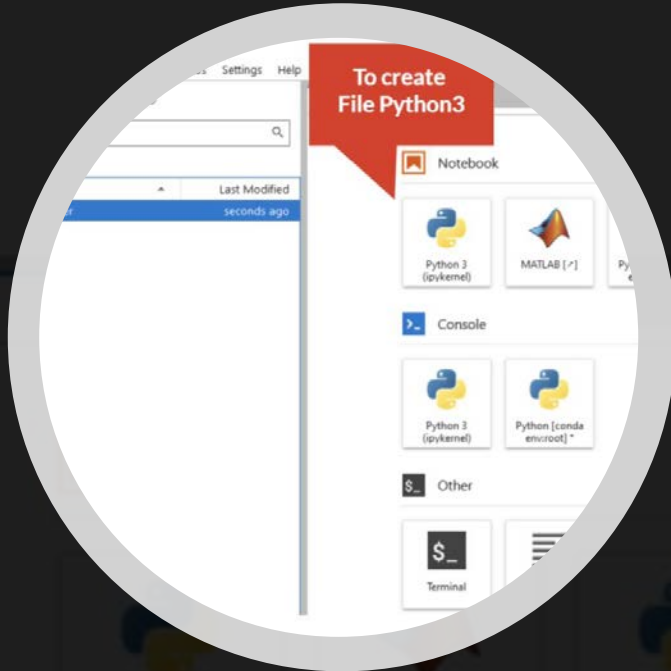
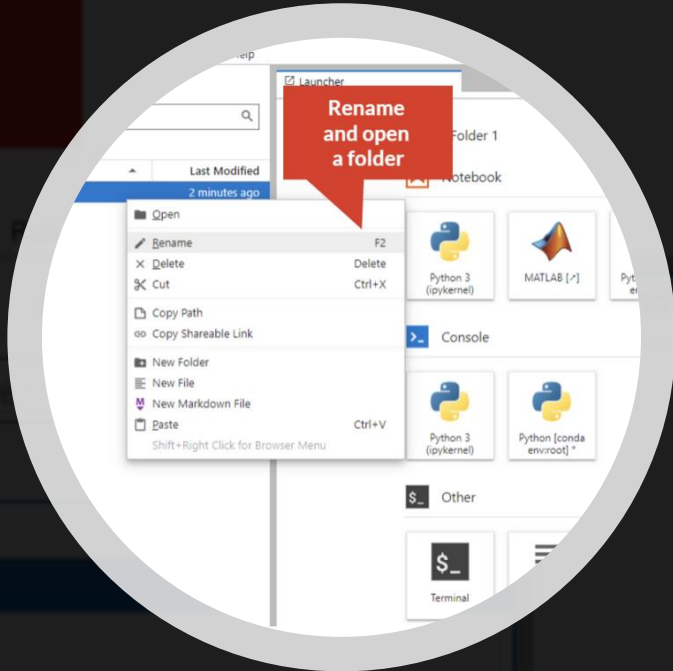
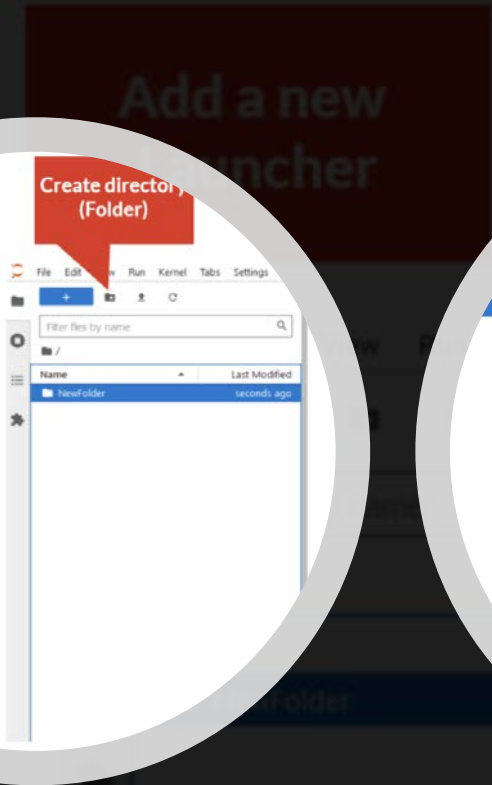


ML/DL/HPC Ecosystem of the HybriLIT Heterogeneous Platform: New Opportunities for Applied Research



In 2022, on the ML/DL/HPC ecosystem, it became possible to run the **MATLAB** code in Jupyter Notebook, which allows one to effectively perform applied and scientific computations.





Getting started with Jupyter Notebook



HLIT-VDI Remote Desktop



4 VIRTUAL MACHINES

Centos 7.9

RAM 24 Gb

Nvidia Tesla M60, 8 Gb

10 Gbit / sec

SOFTWARE

Comsol

Maple

Mathematica

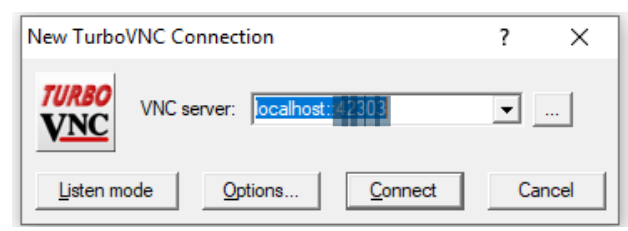
Matlab

The screenshot displays a remote desktop session titled "TurboVNC: vm02.hydra.local:2 (matma) [Tight + JPEG 1X Q95 + CL 1]". The desktop environment includes a sidebar with icons for "Computer", "matma's Home", "Trash", "Maple", "Mathematica", "Comsol", and "Matlab". Several windows are open:

- COMSOL Multiphysics:** A "Model Wizard" dialog box is open, showing options for "Select Space Dimension": 3D, 2D Axisymmetric, 2D, and 1D Axisymmetric.
- Maple:** A "Welcome to Maple!" window is open, displaying a "New to Maple?" message and a "Text Math" editor.
- MATLAB R2020b - academic use:** The MATLAB interface is open, showing a "Command Window" with the prompt "fx >>".
- Mate Terminal:** A terminal window is open, displaying system information for GPU memory usage:

GPU ID	GI ID	CI ID	PID	Type	Process name	GPU Memory Usage
0	N/A	N/A	1427	G	/usr/bin/X	62MiB
0	N/A	N/A	1483	G	/usr/bin/gnome-shell	8MiB
0	N/A	N/A	24272	G	...R2020b/bin/glnxa64/MATLAB	1MiB
0	N/A	N/A	24454	G	...in/glnxa64/comsollauncher	62MiB
0	N/A	N/A	24564	G	.../Linux-x86-64/Mathematica	2MiB
0	N/A	N/A	24779	G	...jre.X86_64_LINUX/bin/java	5MiB

The terminal prompt is "[matma@vm02 ~]\$ nvidia-smi". The taskbar at the bottom shows the following open windows: "Welcome to Wolfram ...", "/cvmfs/hybrilit.jinr.ru/...", "MATLAB R2020b - aca...", "Untitled.mph - COMS...", and "Mate Terminal".



❖ Setup VNC connection using HybriLIT logon credentials



HLIT-VDI Remote Desktop: the workflow





Educational activities: video tutorials for users





Thank you for attention!

HYBRILIT HETEROGENEOUS PLATFORM at MLIT JINR:

<http://hlit.jinr.ru>





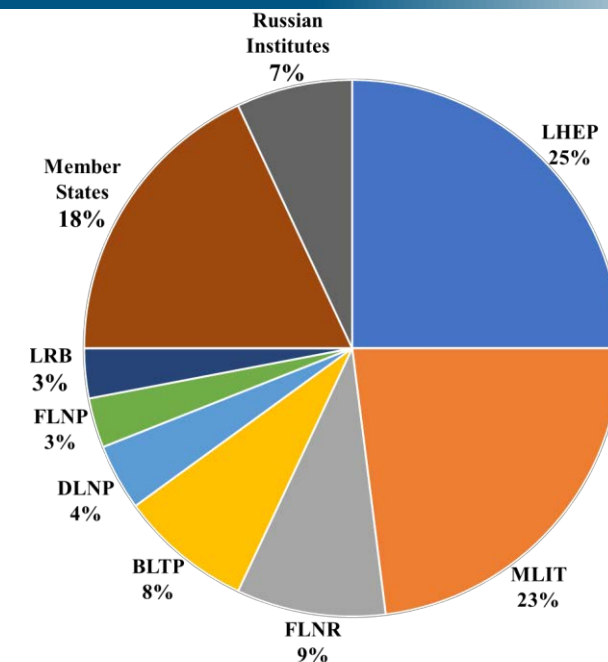
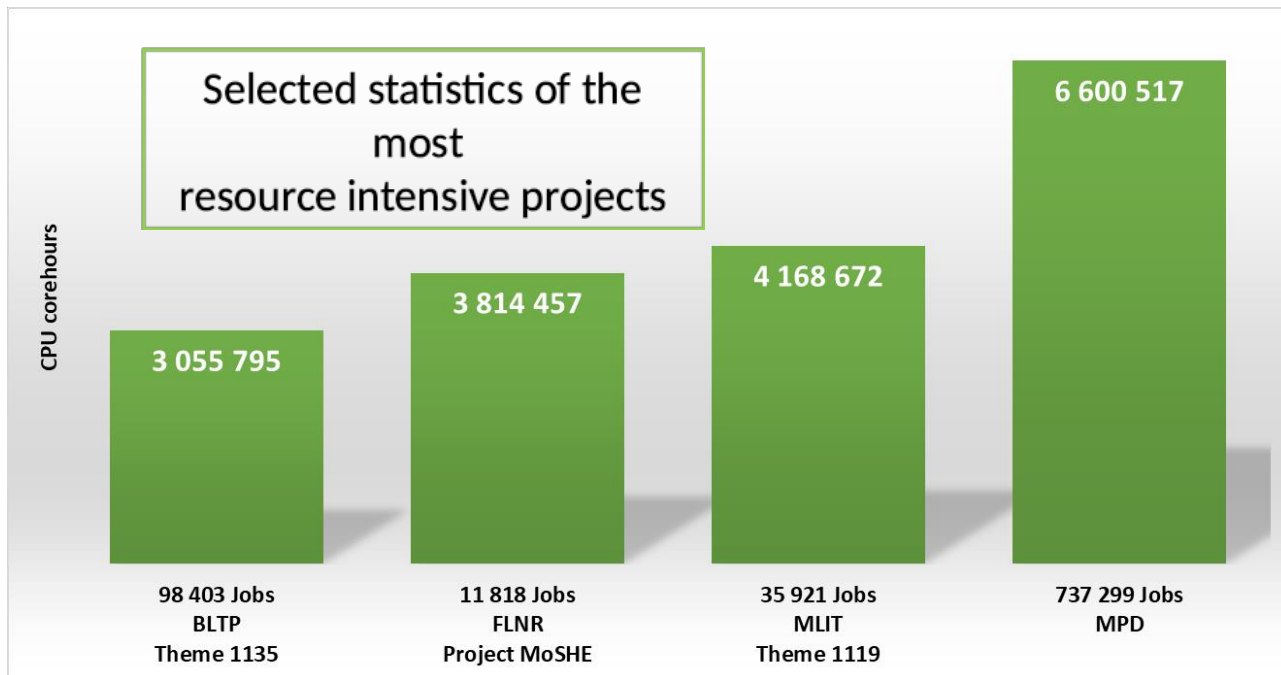
Using the “Govorun” Supercomputer in 2023



The resources of the “Govorun” SC are used by scientific groups from all the Laboratories of the Institute within **25 themes** of the JINR Topical Plan.

The projects that mostly intensive use the CPU resources of the “Govorun” SC:

- NICA megaproject,
- simulation of complex physical systems,
- computations of the properties of atoms of superheavy elements,
- calculations of lattice quantum chromodynamics.



Within 2023, all groups of users completed **~680k jobs on the CPU** component, which corresponds to 16 million core hours, and **7k jobs on the GPU** component, which corresponds to 45k GPU hours. The average load of **CPU component** was **96.4%**, while the **GPU component** load was **91.2%**.