

Policy on the use of Generative Artificial Intelligence

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CONTEXT

Generative artificial intelligence (AI) tools are being used more and more frequently and are evolving rapidly. Alongside their undeniable usefulness as a tool for improving and accelerating learning processes, problem-solving, and project implementation, AI also raises serious concerns regarding scientific integrity, accountability, the training of students and researchers, the evaluation of research outputs for career purposes, the proper functioning of peer review, as well as the very definition of research work based on creativity and human judgment. In this context, we believe it is useful to establish general guidelines to be followed in the activities carried out at the Pitaevskii Center on Bose-Einstein Condensation (hereinafter “BEC Center”).¹ Many of the points below describe scientific best practices, but the advent of generative AI – and the shortcuts it provides – make their formulation a pressing issue. This document should be considered a work in progress and will likely need to be updated regularly as the capabilities of AI evolve; also, it is to be seen complementary to other recommendations, such as the European Commission’s Living guidelines on the responsible use of generative AI in research.²

WHAT RESEARCHERS SHOULD DO

All research staff at the Pitaevskii BEC Center are warmly invited to adhere to the following code of conduct.

- i) **AI tools cannot replace researchers’ expertise and judgment.** Researchers are fully responsible for the accuracy of their work and must review all AI generated content. This implies that, whenever an AI tool has been used to a significant extent to obtain a specific result (whether mathematical or physical, involving data analysis, graphical representations, coding, etc.), the researchers responsible for that part of the study **must be able to explain** in detail, in their own words, the procedures followed and the significance of the results. In the absence of such an explanation, the work must be considered incomplete and unsuitable for publication.
- ii) The use of AI in the production of scientific articles may call into question the **meaning of authorship**, introducing new types of contributions to research.

¹ The use of AI also incurs a series of important technical, privacy, and security questions; the purpose of this document is to set out a series of general principles, while for issues of more technical or legal nature dedicated documents should be consulted.

²<https://european-research-area.ec.europa.eu/news/living-guidelines-responsible-use-generative-ai-research-published>

Consistent with the principle of full responsibility and judgment on the part of the researchers involved in the work, it is considered appropriate that the list of authors for an article should include **only researchers who have actively participated** in the research and who **are familiar with** the details of the methods used and the results obtained – at least to the extent that they can present them orally to an audience of expert peers.

- iii) **AI tools must be used transparently.** Researchers must keep track of the uses of AI that affect the results of their work (derivations, numerical work and coding, data analysis, literature review, substantial parts of the text). All articles containing such contributions must include a statement indicating which AI tools were used, for which tasks, and what type of verification was performed on the results produced by the AI. Also, all theses of undergraduate students and doctoral dissertations must include a detailed statement regarding the use of AI tools. Exceptions are permitted for AI tools used exclusively for the translation, correction, and non-substantive editing of texts.
- iv) All texts (articles, theses, etc.) written with the help of AI tools must undergo a **thorough editing process**. In particular, **one must verify** that all terms used convey the intended meaning, that all statements made can reasonably be upheld, avoiding pompous but unfounded phrasing and baseless claims regarding importance and applications. Moreover, when AI is used to generate the list of references in the bibliography of an article or a thesis, the list must be carefully reviewed to ensure that each reference is cited in the correct context and, if relevant in terms of the priority of a result, is appropriately commented on. The list must exclude unnecessary or irrelevant references, and in its final form, it must contain only works whose content is known to the authors, either because they have read them or because they have indirect but reliable knowledge of them.
- v) When acting as **referee** of a manuscript for a scientific journal, researchers have to rely on their own judgement. Referees are actors in the strive for furthering human insights, and thus need to understand the paper under review to the best of their capabilities even if it means additional effort. Referees need to be aware of potential issues with breaching confidentiality when uploading the article under review to an AI tool. Even more, a report produced by an AI is of no value to the editor: anyone, in particular the journal itself, can produce a similar document with a single prompt. In a sound peer review process, which is based on a relationship of trust within the scientific community, reports must be the result of **a genuine and honest expert evaluation made by human reviewers**.
- vi) The use of AI can easily lead to the systematic production of incremental results and the **proliferation of well-written articles that are of little scientific value**. Senior researchers have a responsibility not to encourage their younger colleagues to follow this trend, but rather to use AI to improve the quality of their works, when appropriate. Bachelor, master, and PhD thesis have to be viewed as parts of an educational course, and postdoctoral and permanent positions should be seen as stations of lifelong learning. Publication output for output's sake has limited value; AI can rather be a valuable tool to help them gain knowledge and understanding, if its results are critically assessed and digested.

- vii) When **evaluating candidates for positions** at the BEC Center, unless otherwise stated by other laws and regulations, selection committees must **not** use the **number of publications** as a criterion of merit of a candidate. Also, researchers of the BEC Center who serve in advisory, participatory, or leadership roles within funding agencies, university or research institution governing bodies, conference or journal committees must become promoters of a new approach to the evaluation of research outcomes, one that **prioritizes quality over quantity** and measures quality based on the elements of human creativity present in the research. As difficult as this task may be, this effort must be undertaken promptly if we are to prevent science from being undermined by poor practices in the education, training, and promotion of new generations of scientists. This also implies that every decision on a candidate or on the assessment of a student must be made by humans, and candidates should be neither penalised nor rewarded for using AI per se, provided they use it in accordance with the recommendations outlined above.

WHAT THE BEC CENTER SHOULD DO

- a) The capability of AI models depends strongly on the subscription tier. As far as AI tools will prove crucial for research, and according to financial possibilities as well as potential ethical issues, the BEC Center will make its best efforts to acquire **equal access** to state-of-the-art AI tools to all research staff, with priority to early-career researchers, and to ensure that quality of research output does not increasingly reflect financial means of individual researchers rather than ability.
- b) The fast development of AI makes periodic **training** on effective use, resource efficiency, best practices, and research integrity a necessity. The BEC Center will organise regular seminars to enhance distribution of know-how among the affiliated researchers.
- c) AI technology is supplied by a small number of companies. Within its capacities, the BEC Center **coordinates with other institutes and networks** in order to keep access affordable over time, to negotiate terms favourable to research, and to represent the interests of human-led research in the policies of providers and political decision makers.

PRESERVING THE MEANING OF OUR WORK

In view of the rapid development of AI, it is essential to define what the role of the human researcher should be. Many of the above guiding principles follow naturally from that definition.

Science has a twofold purpose: the generation of knowledge – whether driven by curiosity or in response to social and technological needs – and the education of new generations of well-informed individuals who are capable of dealing with the challenges of the future. In these, AI can be a highly useful tool. It can obviate routine tasks. It can help us improve due-diligence checks, e.g., by spotting factual errors or missing relevant references. It can put into our grasp knowledge and tools that otherwise would have been unrealistic to access. However,

- In the production of knowledge, researchers have a clear job: **to guide it, to evaluate it, and consolidate it for best use of humanity**. Best use of humanity

means both eventual technical applications – where knowledge generated purely by AI for AI may also be useful – as well as improving human understanding of nature and **cognitive gain** (*Erkenntnisgewinn*).

- The modern university has at its core the Humboldtian ideal of the **unity of research and education**. It upholds that the best teachers are those that themselves perform research rather than only reiterating canonized knowledge. This unity ensures an evolutionary curriculum that is constantly renewed, incorporating the newest methods and insights. If research is done only by AI, with the user losing understanding of the results, this unity is broken.
- Striving towards the ideal of the **mature citizen**, education means not only education and training of one's juniors, but also of one's own. Excessive use of AI without understanding its output increases immaturity instead of maturity.

BEING AWARE OF CONSEQUENCES

In addition, AI raises issues that require awareness on the part of its users. In particular,

- AI tools are currently offered by a handful of start-ups operating in an **unregulated market**. There is a practical risk: by **outsourcing core aspects of our work** to these providers, we put too much in their hands. AI access could soon become paid-only, and if we have delegated too much, we will no longer be able to do our job. Such dependence on a very small number of providers also undermines our ability to do free and independent research. The appropriate response to this risk is collective rather than individual.
- Running AI has a very **high environmental cost**, and the topic is currently at the center of public debate. Using them indiscriminately, including for simple tasks that can be done by other means, should be avoided in favor of less energy-intensive practices.

Concluding, the use of AI can be an enormous benefit. However, its use needs to never lose the integrity and actual aims of research and education out of sight.