# Kurt Bernardo Wolf memorial lecture

**George Pogosyan[1] and Mariano A. del Olmo[2]⋆**

**1** ICAS, Yerevan State University, Yerevan, Armenia
**2** Departamento de Física Teórica, Atómica y Optica and IMUVA,
Universidad de Valladolid, 47011 Valladolid, Spain

⋆ marianoantonio.olmor@uva.es

*34th International Colloquium on Group Theoretical Methods in Physics
Strasbourg, 18-22 July 2022*

## Abstract

**A personal view of the Mexican mathematical physicist Kurt Bernardo Wolf (1942-2022) is presented here.**

*To the memory of our friend and colleague Bernardo.*

## Introduction by M. A. del Olmo

Our colleague and friend Kurt Bernardo Wolf Bogner passed away on 25th May 2022 in Cuernavaca, Mexico. I received the sad news of his death a couple of days later and it shocked me. Just ten days before we had exchanged some emails. I was aware that he did not have good health, but I didn't think it was too serious for such a quick fatal outcome.

I met Bernardo in 1981 in Canterbury at Group10. It was my first participation in this series of Colloquia. We have been friends ever since. I have always been charmed by his ease in engaging in conversation on any subject, his boundless curiosity, his touch of eccentricity and his affability. We did not collaborate scientifically, although in recent years we have coincided on some topics we have discussed when we have met.

I do not want to be much longer, because our friend George Pogosyan, who has worked actively with him for many years, has prepared a memorial lecture. Unfortunately George is unable to be here with us due to health problems. Let me send a warm *abrazo* (hug) to George with our best wishes for a quick recovery.

## Memorial lecture by G. Pogosyan

Kurt Bernardo Wolf, was a great friend to all of us, as great humanist and brilliant scientist. As a theoretical physicist deeply influenced the Mexican science, and not only. He left us on the 25th of May 2022 in Cuernavaca, Mexico.

In science he is well known for his contribution to mathematical physics, in particular in the application of group theory and symmetry methods to fundamental problems in atomic and molecular physics, classical and quantum optics, in Fourier integral transforms (where he wrote a book titled *Integral Transforms in Science and Engineering*), in theory of differential equations, special functions, integrable and superintegrable systems. He is the author of more than 200 articles and two scientific books [1, 2].

Bernardo Wolf was encouraged by his parents from a young age to pursue his studies in sciences. After finishing the high school in 1960, being 16 years old, he started his undergraduate studies at the Universidad Nacional Autónoma de México (UNAM) to become a theoretical physicist, where his PhD advisor was Marcos Moshinsky. To continue his PhD studies he moved to the Weizmann Institute of Science and the Tel-Aviv University to finish his PhD thesis [3]. After obtaining his PhD in 1970, he lived in Gothenburg, Sweden, where he was a post-doctoral associate at Chalmers University. Finally, in 1971 he returned to Mexico where he became a principal investigator at the Instituto de Ciencias Físicas at UNAM.

In 2022 he was elected a Fellow by Optica for his outstanding and numerous contributions to mathematical optics, including signal analysis, by employing symmetry methods known as group theory. In the same year, the Mexican Government's National System of Researchers (SNI) honoured him as Emeritus National Researcher.

Along with a selfless love for theoretical physics, Bernardo's soul was craving for great travels. In his youth, he travelled through Ethiopia, Kenya, Uganda, Rwanda, Burundi, and

Tanzania, including Kilimanjaro, and South Asia, including Persia, Afghanistan, Pakistan and India. Bernardo Wolf authored a book about his travels [4].

Among many of his talents, he especially stood out as a brilliant organizer. In 1986, Wolf became the founding director of the Centro Internacional de Ciencias (CIC) at his alma mater UNAM. He remained director at CIC until 1993, where he organized more than a dozen symposiums and conferences. For a long time he was a member of the Standing Committee of ICGTMP and QTS series of conferences and main organizer of Group25 in Cocoyoc, Mexico in 2004. By 1987, he helped found the Mexican Academy of Optics (Academia Mexicana de Óptica).

I first met Bernardo Wolf almost thirty years ago in 1995 at Dubna, Russia, when he attended our Conference on Symmetry Methods in Physics. We immediately found many common scientific interests, especially in the field of the theory of superintegrable systems. The next time we met was in Cuernavaca, in 2000, where I was invited for two years as researcher in the Centro de Ciencias Fisicas. In Cuernavaca, under the patronage of Bernardo Wolf, we had a good scientific group, which, in addition to me, also included Natig Atakishiyev. In the past few years, Alexander Yakhno from the University of Guadalajara has also joined us. We managed to publish two extensive rounds of scientific articles (about 20) concerning the definition of Wigner distribution functions on n-dimensional spaces of constant curvature (spheres and hyperboloids) and superintegrable systems of Zernike type. By the way, recent studies (the Zernike system) have been continued in the work of Mariano A. del Olmo and Francisco Hérranz.

Bernardo was one of the brightest and original-thinking persons I have ever met. I was amazed by his knowledge. He understood well of Christianity or Islam, and as orientalist had a deep understanding of the Indian philosophy. He was fluent not only in Spanish and English which allowed him to brilliantly write articles in both languages, but also could read in many other languages such as Russian, Hebrew, or Swedish. I have to say that the beauty was his god and simplicity his ideal. It manifested in everything, whether in buying a car, decorating his house or his office. I remember when I sat in his office, he always played classical music before starting to work on his computer.

He knew how to be a great friend. Two weeks before his death, he wrote to me:

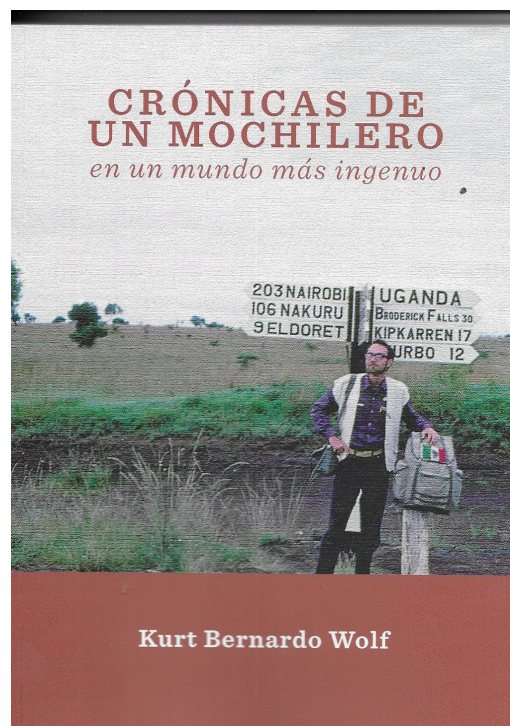
*Dearest George!*

*It is good to know that you are there, even with a lot of health problems. Unfortunately, I am not so healthy either. Since 2020 I have been using oxygen 24/7 due to lung problems, and I am also confined at home. I have been working as far as I can on-line: Kenan graduated with*

*honors, 3 articles on Bessels and $2 \times 2$ matrices written, etc., Also my "crónicas de un hitchhiker in a more amicable world" (in Spanish) was published (292 pages, 120 of my photos) but it is becoming increasingly difficult to focus on things. I cannot return to Yerevan in this condition, but I would like to accompany you spiritually in our joint effort to stay alive, well and with bright future. About Natig, earlier this year he underwent a heart operation, and his state of health is also not great. ...such is life, as we often said...*

*Still, may I send you a warm abrazo, such as only good old friends can give!*

*Bernardo*

I am blessed to remember the time spent in Cuernavaca. These memories warm my heart.

## Acknowledgements

The authors would like to thank Gunnar Wolf for permission to use the photos.

## References

[1] K. B. Wolf, *Integral transforms in science and engineering*, Springer, New York, USA, ISBN 9781475708721 (1979), doi:10.1007/978-1-4757-0872-1.

[2] K. B. Wolf, *Geometric optics on phase space*, Springer, Belrin, Heidelberg, Germany, ISBN 9783642060366 (2004).

[3] K. B. Wolf, *Group theory and Regge poles*, PhD thesis, Tel Aviv University, Israel (1969).

[4] K. B. Wolf, *Crónicas de un mochilero ingenuo*, Tinta En Pié, Cuernavaca, México, ISBN 9786079178420 (2022).