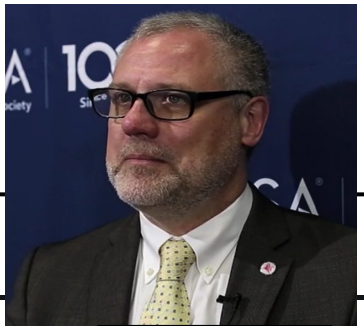

# Henry C. Kapteyn

**Henry C. Kapteyn** (born January 21, 1963) is an American physicist and professor at the University of Colorado Boulder. He is a Fellow of JILA, a joint institute of the University of Colorado and the National Institute of Standards and Technology (NIST). Kapteyn is known for his work in ultrafast optical science, particularly the development of femtosecond lasers and tabletop coherent X-ray sources.[1][2] His research focuses on ultrafast laser technology, dynamics in molecular and materials systems, and coherent X-ray generation.[2] He is the co-founder and Chief Technical Officer of KMLabs, a company specializing in ultrafast laser systems.[3]

| | |
|---|---|
| **Born** | January 21, 1963<br>Chicago suburbs, Illinois, U.S. |
| **Fields** | Physics<br>Ultrafast Lasers<br>Coherent X-ray Science |
| **Institutions** | University of Colorado Boulder<br>JILA (NIST/University of Colorado) |
| **Alma mater** | Harvey Mudd College (BS)<br>Princeton University (MS)<br>University of California, Berkeley (PhD) |
| **Known for** | Femtosecond lasers<br>Tabletop X-ray lasers<br>High-harmonic generation |
| **Awards** | National Academy of Sciences Member<br>Benjamin Franklin Medal in Physics (2021)<br>Willis E. Lamb Award (2012)<br>Arthur L. Schawlow Prize in Laser Science (2010)<br>R.W. Wood Prize (2010)<br>Ahmed Zewail Award (2009)<br>Adolph Lomb Medal (1993) |

## Early life and education

Kapteyn was born in 1963 in the suburbs of Chicago, Illinois, to parents who were post-World War II immigrants from the Netherlands.[4] His early interest in science was encouraged by his family. He is married to Margaret Murnane. They work together and operate their own lab at JILA at the University of Colorado.[5]

He earned his Bachelor of Science in physics from Harvey Mudd College in 1982, followed by a Master of Science from Princeton University in 1984. He completed his Ph.D. in physics at the University of California, Berkeley in 1989, where he began working with lasers.[3][4]

## Career

After his Ph.D., Kapteyn joined the University of Colorado Boulder in 1999 as a Professor of Physics and a Fellow of JILA.[1] He has held positions in the Department of Physics and Electrical and Computer Engineering.[6]

In 1994, he co-founded KMLabs with his wife and collaborator, Margaret Murnane.[7] The company commercializes ultrafast laser technologies developed in their research.[3]

## Research

Kapteyn's research involves developing tabletop-scale laser technology for coherent X-rays, ultrafast dynamics in molecular and materials systems, and high-harmonic generation.[2][8] Key contributions include techniques for generating coherent X-rays using femtosecond lasers, enabling studies at short length and time scales.[3]

His work spans optics, lasers, ultrashort pulses, and optoelectronics, with applications in material behavior analysis.[8]

## Awards

Kapteyn is a member of the National Academy of Sciences and a Fellow of the American Physical Society, Optical Society of America, and American Association for the Advancement of Science.[3] Notable awards include:

- Benjamin Franklin Medal in Physics (2021, shared with Margaret Murnane)[4]
- Willis E. Lamb Award for Laser Science and Quantum Optics (2012)
- Arthur L. Schawlow Prize in Laser Science (2010)
- R.W. Wood Prize (2010)
- Ahmed Zewail Award in Ultrafast Science and Technology (2009)
- Adolph Lomb Medal (1993)[3]

## Publications


- Rundquist, A.; Durfee, C. G.; Chang, Z.; Herne, C.; Backus, S.; Murnane, M. M.; Kapteyn, H. C. (1998). "Phase-matched generation of coherent soft X-rays". *Science* **280** (5368): 1412–1415. doi:10.1126/science.280.5368.1412.
- Chang, Z.; Rundquist, A.; Wang, H.; Murnane, M. M.; Kapteyn, H. C. (1997). "Generation of Coherent Soft X Rays at 2.7 nm Using High Harmonics". *Physical Review Letters* **79** (16): 2967. doi:10.1103/PhysRevLett.79.2967.</ref>
- Backus, S.; Durfee, C. G.; Murnane, M. M.; Kapteyn, H. C. (1998). "High power ultrafast lasers". *Review of Scientific Instruments* **69** (3): 1207–1223. doi:10.1063/1.1148795.
- Bartels, R. A.; Backus, S.; Zeek, E.; Misoguti, L.; Vdovin, G.; Christov, I. P.; Murnane, M. M.; Kapteyn, H. C. (2000). "Shaped-pulse optimization of coherent emission of high-harmonic soft X-rays". *Nature* **406** (6792): 164–166. doi:10.1038/35018029.</ref>
- Christov, I. P.; Murnane, M. M.; Kapteyn, H. C. (1997). "High-Harmonic Generation of Attosecond Pulses in the “Single-Cycle” Regime". *Physical Review Letters* **78** (7): 1251. doi:10.1103/PhysRevLett.78.1251.
- Tien, A.-C.; Backus, S.; Kapteyn, H.; Murnane, M.; Mourou, G. (1999). "Short-Pulse Laser Damage in Transparent Materials as a Function of Pulse Duration". *Physical Review Letters* **82** (19): 3883. doi:10.1103/PhysRevLett.82.3883.

"Generation of 11-fs pulses from a self-mode-locked Ti:sapphire laser". *Optics Letters* **18** (12): 977–979. doi:10.1364/ol.18.000977.

- Siemens, M. E.; Li, Q.; Yang, R.; Nelson, K. A.; Anderson, E. H.; Murnane, M. M.; Kapteyn, H. C. (2010). "Quasi-ballistic thermal transport from nanoscale interfaces observed using ultrafast coherent soft X-ray beams". *Nature Materials* **9** (1): 26–30. doi:10.1038/nmat2568.
- Murnane, M. M.; Kapteyn, H. C.; Rosen, M. D.; Falcone, R. W. (1991). "Ultrafast X-ray Pulses from Laser-Produced Plasmas". *Science* **251** (4993): 531–536. doi:10.1126/science.251.4993.531.

## References

1. "Henry C. Kapteyn - JILA". *jila.colorado.edu*. Retrieved 2026-01-23.
2. "Henry Kapteyn". *colorado.edu*. Retrieved 2026-01-23.
3. "Founders and Leadership Team - KMLabs". *kmlabs.com*. Retrieved 2026-01-23.
4. "Henry C. Kapteyn - The Franklin Institute". *fi.edu*. Retrieved 2026-01-23.
5. Davis, T. H. (2006). "Profile of Margaret M. Murnane". *Proceedings of the National Academy of Sciences* **103** (36): 13276–13278. doi:10.1073/pnas.0606322103. PMID 16938855. PMC 1569154. //www.ncbi.nlm.nih.gov/pmc/articles/PMC1569154/.
6. "Henry Kapteyn – NAS - National Academy of Sciences". *nasonline.org*. Retrieved 2026-01-23.
7. "KMLabs Founder & CEO Henry C. Kapteyn, Interviewed on CCTV". *kmlabs.com*. Retrieved 2026-01-23.
8. "Henry C. Kapteyn: Physics H-index & Awards - Academic Profile". *research.com*. Retrieved 2026-01-23.

## External links