Synopsys Acquires Ansys: Implications for Engineering Simulation and Atomistic Modeling

Stevan Armaković[1,2*] and Sanja J. Armaković[1,3]

[1]*Association for the International Development of Academic and Scientific Collaboration (AIDASCO)*

[2]*University of Novi Sad, Faculty of Sciences, Department of Physics*

[3]*University of Novi Sad, Faculty of Sciences, Department of Chemistry, Biochemistry and Environmental Protection*

*Correspondence: stevan.armakovic@aidasco.org

Abstract: The completion of Synopsys's acquisition of Ansys in 2025 represents one of the most significant developments in the area of engineering simulation and design software. Beyond its industrial and financial dimensions, this merger signals a deeper integration of atomistic, device-level, and system-level modeling approaches. In this article, the broader implications of the Synopsys-Ansys union are discussed with a particular focus on atomistic modeling and first-principles simulations. The analysis is placed in a historical context by revisiting Synopsys's earlier acquisition of QuantumWise and the subsequent development of QuantumATK as a bridge between quantum-mechanical materials modeling and semiconductor technology design. The article discusses how the growing integration of electronic design automation, multiphysics simulation, and atomistic modeling represents a fundamental shift in modern engineering practice. As these approaches increasingly merge, traditional disciplinary boundaries between physics, chemistry, materials science, and engineering become less distinct, and atomistic simulations emerge as a key element of industrial research, technology development, and interdisciplinary workflows.

Keywords: Synopsis; Ansys; QuantumWise; QuantumATK; atomistic modeling; Sparrow Quantum

1. Introduction

In July 2025, Synopsys, one of the world's leading electronic design automation (EDA) companies, officially completed its $35 billion acquisition of Ansys [1–4], a global pioneer in physics-based engineering simulation. The deal, years in the making and requiring regulatory approval across the United States, European Union, United Kingdom, and China, brings together Synopsys's strengths in semiconductor design and electronic design automation with Ansys's leadership in high-fidelity, physics-based engineering simulation.

To put the scale of this transaction into perspective, in 2022, Elon Musk paid approximately $44 billion for the acquisition of Twitter (now X) [2,5,6]. Although the

Citation: S. Armaković and S.J. Armaković, AIDASCO Reviews 3, 2 (2025) 2-8. DOI: https://doi.org/10.59783/aire.2025.98
Copyright: ©2025 by the authors. Submitted for open access publication under the conditions of the AIDASCO publishing

Synopsys-Ansys deal is smaller than the Twitter acquisition by nearly $9 billion, it nonetheless ranks among the largest technology-sector transactions of recent years, showing its exceptional financial and strategic significance. Yet, unlike the highly publicized Twitter acquisition, the Synopsys-Ansys merger attracted comparatively limited public attention. This difference is hardly surprising, as social networking platforms engage a far broader segment of the general population than specialized tools for molecular and semiconductor modeling. Nevertheless, the long-term technological impact of the Synopsys-Ansys acquisition may ultimately exceed that of many high-profile social media transactions, given its potential to shape the future of engineering, materials design, and advanced technology development.

Beyond its financial magnitude and industrial significance, however, this acquisition carries an equally important message for the atomistic modeling community. It signals a potential turning point in how molecular- and materials-level simulations may be integrated into full-device and system-level design workflows.

2. Strategic Foundations: The QuantumWise Acquisition in 2017

To fully appreciate the significance of the Synopsys-Ansys union, it is helpful to revisit an earlier milestone from 2017, when Synopsys strategically expanded its modeling portfolio by acquiring the Danish company QuantumWise [7–9]. Known for its flagship software, Atomistix ToolKit (ATK) and its intuitive interface, Virtual NanoLab, QuantumWise has established itself as a respected name in first-principles modeling, particularly in density functional theory (DFT), nonequilibrium Green's function (NEGF) transport, and nano-device design.

Figure 1. QuantumWise logo illustrating the atomistic modeling concept.

We still vividly remember the excitement of working with ATK for the first time in 2015. At the time, it was a genuine game changer for us, marking the beginning of our more serious engagement with DFT calculations on periodic systems. We ran Atomistix ToolKit on an AMD FX-8370 CPU with just 8 GB of RAM. Despite the modest hardware, it was possible

Citation: S. Armaković and S.J. Armaković, AIDASCO Reviews 3, 2 (2025) 2-8. DOI: https://doi.org/10.59783/aire.2025.98
Copyright: ©2025 by the authors. Submitted for open access publication under the conditions of the AIDASCO publishing

to perform DFT calculations on smaller unit cells, up to around 40 atoms, quite efficiently using compact basis sets.

Several years later, in 2022, we had the opportunity to work with QuantumATK, the evolved successor of ATK, on a Ryzen 3700X system with 32 GB of RAM. That experience was equally smooth and enjoyable. Interestingly, our introduction to density-functional tight-binding (DFTB) methods also came through Atomistix ToolKit, and these approaches soon became a regular component of our computational workflow.

Our first publication employing ATK appeared in 2016 [10]. Since then, we have published several additional papers featuring simulations carried out using QuantumATK, spanning different materials systems and research questions.

3. A Broader Scientific Context

There is also a noteworthy historical dimension to the story of QuantumWise. Its founder and lead developer, Dr. Kurt Stokbro, later became the CEO and an early investor of Sparrow Quantum [11], a photonic quantum technology spin-out from the Niels Bohr Institute founded by Prof. Peter Lodahl. Today, Sparrow Quantum is recognized as a pioneer in deterministic single-photon technology, with ambitions to play a central role in the development of distributed quantum computing.

Beyond his entrepreneurial role, Dr. Stokbro authored highly cited and foundational scientific works that directly supported the theoretical frameworks and numerical methodologies implemented in Atomistix ToolKit and later QuantumATK (Figure 2). These contributions, particularly in the areas of quantum transport, nonequilibrium Green's function formalism, and atomistic modeling of nanoscale devices, laid much of the scientific groundwork upon which QuantumWise was built, establishing the methodological depth and credibility that later made the platform highly attractive for industrial adoption and integration. Here, we highlight just a few of those highly influential publications [12–16].

Figure 2. QuantumATK visual identity.

This trajectory shows how atomistic modeling tools often form the intellectual and technological foundation for advances that extend far beyond their original application domains.

Citation: S. Armaković and S.J. Armaković, AIDASCO Reviews 3, 2 (2025) 2-8. DOI: https://doi.org/10.59783/aire.2025.98
Copyright: ©2025 by the authors. Submitted for open access publication under the conditions of the AIDASCO publishing

As emphasized in Synopsys's official communication in 2017, the QuantumWise acquisition was part of a broader strategy to advance Design Technology Co-Optimization (DTCO), a methodology that tightly integrates process technology and design optimization across all levels of the semiconductor stack. As transistor dimensions continue to shrink, quantum mechanical effects increasingly dominate device behavior, making atomistic-level insight indispensable.

Synopsys noted that the acquisition of QuantumWise would strengthen early-stage process and device research for next-generation memory and logic technologies. The move was widely welcomed within the modeling community, particularly because of QuantumWise's ability to balance advanced computational capabilities with a user-friendly visual interface.

Reports in financial and technology media also highlighted that the acquisition strengthened Synopsys's position in an increasingly competitive simulation area by adding state-of-the-art tools for nanoscale materials and device modeling, an area of rapidly growing importance in semiconductor research and materials innovation.

Following the acquisition, the ATK platform was rebranded as QuantumATK and fully integrated into Synopsys's TCAD suite. Today, QuantumATK continues to serve the global atomistic modeling community with robust implementations of DFT, semiempirical methods, molecular dynamics, and seamless interfacing with other Synopsys simulation tools.

4 From Atoms to Systems: The Role of Ansys

Fast forward to 2025, and the acquisition of Ansys (Figure 3) represents the logical next step in Synopsys's long-term vision: the creation of a fully integrated design and simulation environment spanning quantum-level materials modeling to system-level performance optimization.

Figure 3. Ansys logo following its acquisition by Synopsys.

Citation: S. Armaković and S.J. Armaković, AIDASCO Reviews 3, 2 (2025) 2-8. DOI: https://doi.org/10.59783/aire.2025.98
Copyright: ©2025 by the authors. Submitted for open access publication under the conditions of the AIDASCO publishing

Ansys is globally recognized for its high-fidelity multiphysics simulation tools, encompassing mechanical, thermal, fluid, and electromagnetic domains. These capabilities complement Synopsys's strengths in chip and system design, enabling simulation workflows that extend from transistor-level behavior and thermal dissipation to electromagnetic interference and mechanical reliability.

For users of atomistic tools such as QuantumATK, the implications are substantial. With Ansys now part of the Synopsys ecosystem, future workflows may more naturally incorporate coupled-physics simulations, allowing researchers to investigate not only how a molecule or material behaves electronically, but also how it responds to mechanical stress, heat, and electromagnetic fields within a unified modeling framework.

5. Conclusion

The Synopsys-Ansys acquisition is not merely a merger of two companies; it represents the formation of a platform for end-to-end innovation, targeting advanced applications in artificial intelligence, aerospace, automotive engineering, data centers, energy systems, and materials science.

For the field of atomistic modeling, this development indicates a broader trend: simulations that were once confined mainly to academic research environments are now becoming integral to industrial R&D, materials discovery, and device fabrication at scale. While Synopsys has not yet announced specific changes to QuantumATK following the Ansys acquisition, the overall integration trajectory strongly suggests that tighter coupling between first-principles modeling and system-level design is on the horizon.

As this convergence continues, the traditional boundaries between physics, chemistry, electrical engineering, and materials science are likely to blur even further. For those working in molecular and atomistic modeling, the Synopsys-Ansys acquisition sends a clear signal: atomistic-level simulation is no longer a niche activity. It is increasingly recognized as a foundational component of modern engineering workflows.

Author's note

A shorter and less formal version of this perspective was originally published as an article blog post on Atomistica.online. The present article represents an edited, expanded, and contextualized version prepared specifically for publication in *AIDASCO Reviews*.

Citation: S. Armaković and S.J. Armaković, AIDASCO Reviews 3, 2 (2025) 2-8. DOI: https://doi.org/10.59783/aire.2025.98
Copyright: ©2025 by the authors. Submitted for open access publication under the conditions of the AIDASCO publishing

References

[1] EU approves Synopsys' $35 billion Ansys deal under conditions, Reuters (2025). https://www.reuters.com/markets/deals/eu-approves-synopsys-35-billion-ansys-deal-under-conditions-2025-01-10/ (December 24, 2025).

[2] H. Jin, C. Oguh, C. Oguh, Explainer: How Elon Musk funded the $44 billion Twitter deal, Reuters (2022). https://www.reuters.com/markets/us/how-will-elon-musk-pay-twitter-2022-10-07/ (accessed 2025).

[3] 10:54 Am Edt, Synopsys Clears Final Regulatory Hurdle for $35B Ansys Deal, Investopedia (n.d.). https://www.investopedia.com/synopsys-clears-final-regulatory-hurdle-for-usd35b-ansys-deal-11771448 (accessed December 2025).

[4] Synopsys Completes Acquisition of Ansys, (n.d.). https://investor.synopsys.com/news/news-details/2025/Synopsys-Completes-Acquisition-of-Ansys/default.aspx (accessed December 2025).

[5] C. Katje, Elon Musk/Twitter Saga Began 1 Year Ago Today: What Happened Since And What Could Be Next - PayPal Holdings (NASDAQ:PYPL), Benzinga (n.d.). https://www.benzinga.com/news/23/04/31810229/elon-musk-bought-twitter-1-year-ago-a-look-back-at-whats-happened-since-and-what-could-be-next (accessed December 2025).

[6] C.K. 4 min read, Elon Musk Paid High Price For Twitter But After Years Of Declining Value, X Is Once Again Worth $44 Billion, Yahoo Finance (2025). https://finance.yahoo.com/news/elon-musk-paid-high-price-114537561.html (accessed December 2025).

[7] Z.E.R. Updated, Synopsys (SNPS) Buys QuantumWise, Grows through Acquisitions, Yahoo Finance (2017). https://finance.yahoo.com/news/synopsys-snps-buys-quantumwise-grows-114211534.html (accessed December 2025).

[8] S. Inc, Synopsys Strengthens Design-Technology Co-Optimization Solution with Acquisition of QuantumWise, (n.d.). https://www.prnewswire.com/news-releases/synopsys-strengthens-design-technology-co-optimization-solution-with-acquisition-of-quantumwise-300521429.html (accessed December 2025).

[9] Synopsys Strengthens Design-Technology Co-Optimization Solution with Acquisition of QuantumWise, Synopsys News Releases (n.d.). https://news.synopsys.com/2017-09-18-Synopsys-Strengthens-Design-Technology-Co-Optimization-Solution-with-Acquisition-of-QuantumWise (accessed December 2025).

[10] S. Armaković, S.J. Armaković, Investigation of boron modified graphene nanostructures; optoelectronic properties of graphene nanoparticles and transport properties of graphene nanosheets, Journal of Physics and Chemistry of Solids 98 (2016) 156–166. https://doi.org/10.1016/j.jpcs.2016.07.006.

[11] Sparrow Quantum, (n.d.). https://sparrowquantum.com/ (accessed December 2025).

[12] J. Schneider, J. Hamaekers, S.T. Chill, S. Smidstrup, J. Bulin, R. Thesen, A. Blom, K. Stokbro, ATK-ForceField: a new generation molecular dynamics software package, Modelling Simul. Mater. Sci. Eng. 25 (2017) 085007. https://doi.org/10.1088/1361-651X/aa8ff0.

[13] K. Stokbro, D.E. Petersen, S. Smidstrup, A. Blom, M. Ipsen, K. Kaasbjerg, Semiempirical model for nanoscale device simulations, Phys. Rev. B 82 (2010) 075420. https://doi.org/10.1103/PhysRevB.82.075420.

Citation: S. Armaković and S.J. Armaković, AIDASCO Reviews 3, 2 (2025) 2-8. DOI: https://doi.org/10.59783/aire.2025.98
Copyright: ©2025 by the authors. Submitted for open access publication under the conditions of the AIDASCO publishing

[14] K. Stokbro, J. Taylor, M. Brandbyge, J.-L. Mozos, P. Ordejón, Theoretical study of the nonlinear conductance of Di-thiol benzene coupled to Au(1 1 1) surfaces via thiol and thiolate bonds, Computational Materials Science 27 (2003) 151–160. https://doi.org/10.1016/S0927-0256(02)00439-1.

[15] S. Smidstrup, T. Markussen, P. Vancraeyveld, J. Wellendorff, J. Schneider, T. Gunst, B. Verstichel, D. Stradi, P.A. Khomyakov, U.G. Vej-Hansen, M.-E. Lee, S.T. Chill, F. Rasmussen, G. Penazzi, F. Corsetti, A. Ojanperä, K. Jensen, M.L.N. Palsgaard, U. Martinez, A. Blom, M. Brandbyge, K. Stokbro, QuantumATK: an integrated platform of electronic and atomic-scale modelling tools, J. Phys.: Condens. Matter 32 (2019) 015901. https://doi.org/10.1088/1361-648X/ab4007.

[16] M. Brandbyge, J.-L. Mozos, P. Ordejón, J. Taylor, K. Stokbro, Density-functional method for nonequilibrium electron transport, Phys. Rev. B 65 (2002) 165401. https://doi.org/10.1103/PhysRevB.65.165401.

Citation: S. Armaković and S.J. Armaković, AIDASCO Reviews 3, 2 (2025) 2-8. DOI: https://doi.org/10.59783/aire.2025.98
Copyright: ©2025 by the authors. Submitted for open access publication under the conditions of the AIDASCO publishing