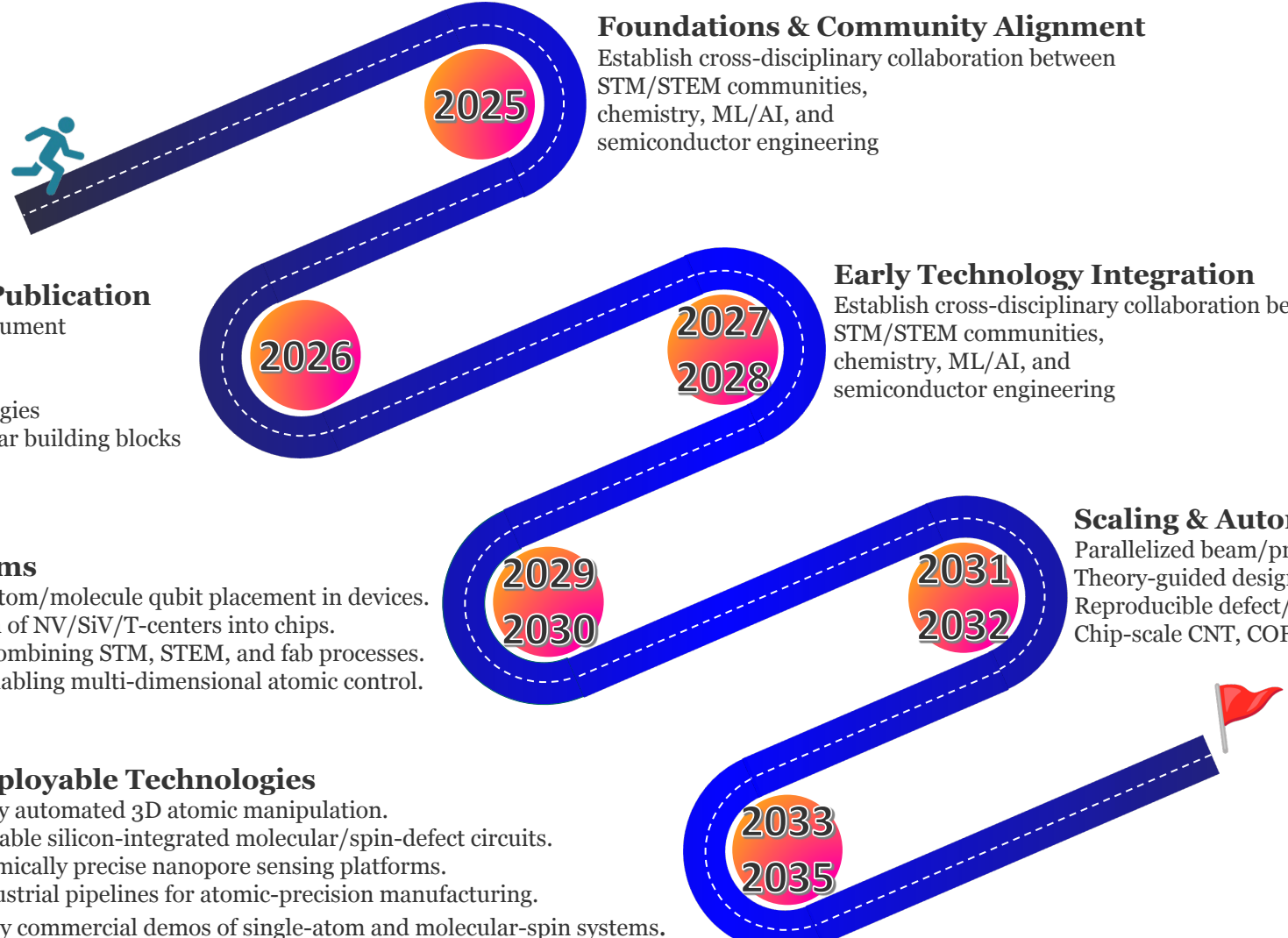

Foundations & Community Alignment

Establish cross-disciplinary collaboration between STM/STEM communities, chemistry, ML/AI, and semiconductor engineering

Workshop & Roadmap Publication

Generate the formal roadmap document
Establish working groups for:

- Beams & probes
- Silicon quantum technologies
- Molecular/macromolecular building blocks

Early Technology Integration

Establish cross-disciplinary collaboration between STM/STEM communities, chemistry, ML/AI, and semiconductor engineering

Prototype Systems

Deterministic single-atom/molecule qubit placement in devices.
Sub-10 nm integration of NV/SiV/T-centers into chips.
Early hybrid devices combining STM, STEM, and fab processes.
Modular workflows enabling multi-dimensional atomic control.

Scaling & Automation

Parallelized beam/probe tools for higher throughput.
Theory-guided design of molecular and framework qubits.
Reproducible defect/molecule placement over mm-scale areas.
Chip-scale CNT, COF, and MOF quantum systems.

Deployable Technologies

Fully automated 3D atomic manipulation.
Scalable silicon-integrated molecular/spin-defect circuits.
Atomically precise nanopore sensing platforms.
Industrial pipelines for atomic-precision manufacturing.
Early commercial demos of single-atom and molecular-spin systems.