

Session III

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Title: From AI Tools to Research Partners: How Agentic AI is Accelerating Discovery

While agentic AI has already transformed software development, we are only beginning to witness its vast and impending impact on scientific and engineering discovery. This talk explores the future of research through the lens of recent Google advancements, moving beyond chat-based passive assistance to autonomous collaboration. We will focus on two rapidly unfolding areas of high impact: novel idea generation and autonomous optimization.

First, we'll examine Co-Scientist, a multi-agentic system built on Gemini. Acting as a virtual research partner, Co-Scientist navigates and analyzes vast datasets to uncover novel patterns and synthesize new hypotheses—and even create detailed research proposals. By streamlining the early phases of scientific work, researchers can explore more new ideas and design more effective experiments, ultimately reducing "time-to-insight".

Next, we'll dive into AlphaEvolve, a Gemini-powered evolutionary optimization agent. Unlike more familiar coding assistants, AlphaEvolve autonomously iterates through the generation, testing, and directed mutation of anything expressible as code to solve higher-order optimization problems. By automating algorithmic discovery, it enables breakthroughs in system efficiency and designs that were previously often out of reach.

Through these case studies, we will illustrate how agentic AI is becoming a vital partner in innovation—not just by accelerating human effort, but by expanding the boundaries of what is discoverable.