Literacy — Agencies: The SBIR/STTR Machine

The small-business research set-asides are the most predictable federal funding path for a small technical company — and the closest thing this discipline has to a repeatable, agency-independent game. This profile explains the machine: the three phases, the statutory engine, the agency cadences, and the economics. It is the profile that makes the curriculum's worked exemplar — a DOE STTR Phase I NOFO — fully legible.

What SBIR and STTR are

SBIR — the **Small Business Innovation Research** program — is a set of federal competitions in which agencies with large research-and-development budgets set aside a slice of that budget *only for small businesses*. The idea: small firms are where the innovation is, so give them a direct, competitive path to federal R&D money.

STTR — the **Small Business Technology Transfer** program — is the sibling with one twist: the small business must **team with a nonprofit research institution** (a university or a laboratory). The research partner is a required part of the team, not an optional helper. The division of labor is prescribed: the small business must perform a meaningful share of the work (the statutory minimums are roughly 40 percent for the small business and 30 percent for the research institution), and the Principal Investigator must be primarily employed by the small business.

If you have read the case study, you have already met the shape: Ravonics is STTR-eligible because of its partnership with **INSTAR Lab**, and its PI is a Ravonics employee. That is the STTR model in one firm.

The statutory engine

SBIR and STTR exist because Congress wrote set-asides into law:

- **SBIR** — agencies with extramural R&D budgets above a threshold (roughly $100 million) must set aside about **3.2 percent** of that budget for SBIR awards.
- **STTR** — agencies with the largest extramural R&D budgets (roughly $1 billion and up) must set aside about **0.45 percent** for STTR awards.

The set-aside percentage and the agency list are set by law and change over time. Roughly a dozen agencies run SBIR — the Department of Defense, the Department of Energy, the National Institutes of Health (part of HHS), NASA, the National Science Foundation, the Department of Homeland Security, the Department of Transportation, the Environmental Protection Agency, the Department of Agriculture, and others — and a smaller subset of the largest research agencies runs STTR.

The "engine" is the point: **the money is set aside by statute, so the competitions happen on a reliable cadence**, and the award sizes are published in advance. That predictability is why SBIR/STTR is such a good teaching ground — and such a good first market for a small technical firm.

The three phases

The SBIR/STTR lifecycle is a three-phase ladder, and it is the whole game in miniature:

Phase	What it is	Money	What it buys
Phase I	Feasibility. Prove the idea is technically sound and the team can do the work.	Typically six to twelve months; tens to low hundreds of thousands of dollars.	A proof of concept, a prototype sketch, a credible Phase II thesis.
Phase II	Development. Build and test the thing the Phase I showed was possible.	Typically one to two years; on the order of a million dollars (agency-dependent).	A working prototype, a validated approach, a path to market.
Phase III	Commercialization. **No SBIR/STTR money.** Turn the developed technology into a product, a sale, a further contract, or private capital.	Non-SBIR funds only.	Revenue, customers, or a follow-on contract — the point of the whole exercise.

The curriculum's worked exemplar walks a real STTR Phase I: a $250,000 Phase I and a Phase II at up to $1,100,000, with the capture-lead discipline of scoring *the pursuit in front of you* and treating Phase II as upside, not value. That is the correct professional posture: **each phase is a separate, competed decision, and you win the one in front of you.**

Agency cadences and topic announcements

Each agency runs SBIR/STTR on its own rhythm, but the shape repeats:

- **Topic announcements.** An agency publishes *topics* — descriptions of a problem it wants solved within its mission ("develop a physics-informed digital twin of a distribution feeder," to borrow the exemplar's DOE flavor).

You respond to a topic with a proposal describing your approach. Some agencies are *topic-driven* (you must choose a published topic); others allow *open or "push" submissions* where you propose your own idea within broad program areas.

- **Cadence.** Most agencies run **one to three solicitations a year**. The DoD runs roughly three a year, with topics published through **DSIP**, the Defense SBIR/STTR Innovation Portal; DOE runs funding-opportunity-style announcements a couple of times a year; NIH runs three SBIR/STTR receipt dates a year; NASA runs two solicitations a year; NSF runs continuous topic windows. The cadence is published and reliable — another reason the program rewards the disciplined pursuer who watches the calendar.
- **Where they live.** Topics and solicitations are published on **SBIR.gov** and on each agency's SBIR site; awards are published on SBIR.gov too, which makes it a public record of who won what — the intelligence layer from where-the-money-flows.

Phase I/II/III economics

Three economic facts shape every SBIR/STTR decision:

1. **The award size is known in advance.** Unlike a services RFP where you bid a price against unknowns, the SBIR/STTR budget is published — the Phase I number, the Phase II ceiling. You know the pool before you invest in a proposal. That makes the bid/no-bid gate (doctrine/04) unusually clean.
2. **The money is cost-reimbursement-shaped, but small and fixed.** Awards are funded on a cost basis with negotiated budgets; the published ceiling is the constraint. The budget and the work must tell one story (doctrine/05).
3. **Phase III is where the money is actually made.** The program's explicit design is that Phases I and II are *subsidized de-risking* and Phase III is *commercial*. For the pursuing firm, the real economic model is: Phase I and II fund the R&D, and Phase III — a government follow-on contract, a commercial sale, or an investment — is the return. A firm that treats a Phase II award as the finish line has missed the point of the program.

The commercialization requirement

SBIR/STTR is not pure research. The statutory intent is that federal R&D dollars lead to *commercialized products and services* that benefit the funding agency's mission and the economy. The practical consequences:

- Proposals must show a credible path to market — the "commercialization plan" is a scored element, not a formality.
- The proposed work must have a **mission benefit** for the agency funding it: a defense topic must help the defense mission, an energy topic must

help the energy mission. “It is cool research” is not enough; “it solves the problem you described” is.
- Awards carry commercialization reporting obligations, and the agencies track what becomes of their Phase II investments.

The lesson for the pursuer: **frame your proposal as an innovation that serves the agency’s mission and can reach a real market** — the dual argument is the winning argument, in SBIR/STTR and in most of this discipline.

The dual-use posture

The phrase you will hear is **dual-use**: technology that serves both a government mission *and* a commercial market. The DoD in particular has pushed SBIR toward dual-use — it wants small companies whose innovations have commercial pull, not just defense-funded widgets — and the commercialization requirement above is the enforcement mechanism. For the small firm, dual-use is a *strategy*: one R&D investment, two markets, and a funding program that rewards exactly that.

The reauthorization reality

A sobering and important fact: the SBIR/STTR programs are not permanent law — they are **periodically reauthorized**, and authorization lapses are real. The authorization lapsed on September 30, 2025 — the first lapse in the programs’ four-decade history — pausing new solicitations and awards across all participating agencies until reauthorization restored them in 2026 through 2031. The lesson is the profile’s standing caution writ small: **the machine is durable, but its current state is a fact to check.** Before you build a strategy on SBIR/STTR, confirm the programs are authorized and the agency you care about is running solicitations — check SBIR.gov and the agency’s own SBIR site.

Learning pointers

Learning pointers. The SBIR/STTR profile is the deepest worked example of the curriculum’s core machinery. - **Doctrine** — doctrine/01 (the small-business detour and assistance vs. contract), doctrine/02 (the NOFO as the STTR document shape), doctrine/04 (the clean bid/no-bid gate the program enables). - **Literacy** — how-to-read-a-nofo (the STTR NOFO anatomy), where-the-money-flows, acronym-decoder (SBIR, STTR, Phase I/II/III). - **Practice** — the worked exemplar is a full STTR Phase I pursuit, from the 15-minute scan to the written call; work it with this profile open. - **Case study** — Ravonics’ INSTAR Lab partnership is the STTR eligibility mechanism; the profile shows what that partnership is worth and what it costs. - **Course** — the capstone (capstone-build-an-orbital) defaults to a published solicitation and works the SBIR/STTR shape well.

- **Verify** — the set-aside percentages, the participating-agency list, the current authorization status, and each agency's cadence change over time; confirm against SBIR.gov and the live solicitation.