



STELLAR
XPLORERS
SPACE STEM PROGRAM

AFA Chapter Involvement Guide

*Your go-to document for getting involved
(or helping others get involved) with StellarXplorers*

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A STEM program of the Air & Space Forces Association

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Involvement Guide Purpose

The StellarXplorers Involvement Guide is designed for Air and Space Force Association (AFA) members to assist in AFA’s Mission to promote aerospace, space design, and science, technology, engineering, and math (STEM) education. This document provides an overview of the various opportunities available for AFA members and chapters in assisting the nationwide effort to science, technology, engineering, and math education via high school student program participation. Keep reading to learn more about engagement steps and how you can facilitate communication with key stakeholders.

StellarXplorers Program Overview

National Space Design Competition

At its core, StellarXplorers (STLX) is a fun, one-of-a-kind space design competition that challenges teams of students across the country to solve orbit determination, satellite component planning, and launch vehicle selection scenarios presented in a series of online rounds. These are real-world space design challenges, and the best part is ***no prior experience is required*** for participation. As part of the competition, all teams are provided with the necessary training and software resources needed for success. We also have a technical mentor program that allows industry professionals to volunteer their time and help teams prepare.

Teams can come from any organized youth organization such as a high school (including home schools), JROTC, Civil Air Patrol, school clubs, scouting units, Boys & Girls Clubs, 4-H, etc. Each team must have an adult Team Director (usually a teacher) and two to six students. Technical mentors are optional but encouraged. There is a nominal \$200 registration fee per team, with waivers offered to JROTC teams and Title I schools.

Upon registering, teams are provided with specific training in the use of Systems Took Kit (STK – a system simulation software), and access to a digital copy of the Understanding Space textbook, a curriculum supplement and study resource for online “team” quizzes given during the competition rounds. The actual competition is accomplished from the team’s home location. Teams are given a

scenario describing the system’s mission and constraints and they provide a solution to a typical space design problem, such as orbit determination, satellite component selection, and launch vehicle planning.

Practice Rounds begin in October with Qualification Rounds beginning in November that determine which teams advance to the Semifinals in February. The top 10 teams from the Semifinals will receive an all-expense-paid trip the National Finals, as well as educational grants for the top 3 finalist teams.

StellarXplorers StellarCamps

StellarCamp is a 5-day summer camp with 4 hours of daily material covering: circular orbits and orbit determination, elliptical orbits and Satellite Component Selection, Launch Vehicle Selection, and ending with a mini-competition for the participating campers.

AFA Member Opportunities

AFA Member recommendations for engagement with local educators, administrators, civic leaders, parents, and citizens will help us establish StellarXplorers teams of high school competitors in your AFA Chapter’s community.

AFA StellarXplorers staff may facilitate communications between your contacts and other stakeholder organizations in your AFA Chapter’s local, state and regional areas to promote participation for student competitors, adult team directors and technical mentors.

AFA Chapter Opportunities

Involvement in StellarXplorers is a great opportunity for AFA Chapters to pursue their aerospace/STEM volunteer efforts and fly the AFA flag.

In supporting the work of AFA’s Vice Chairmen of the Board for Field Operations and Aerospace Education, we request that interested AFA Chapters please consider the below recommendations:

- **Appoint a Chapter representative as the point of contact local StellarXplorers efforts.** This will lead to improved continuity, communications, and consistency. This individual may be your lead for Aerospace Education efforts, or you may choose to designate someone else specifically responsible for leading StellarXplorers coordination.
- **Consider StellarXplorers as an agenda item in your AFA Chapter’s communications.** StellarXplorers has events throughout the year. A typical “year” for StellarXplorers runs May to April. Listed below is the general timeline of STLX happenings.

May	Registration for annual National Space Design Competition begins. Encourage schools to register (target – teachers, students, parents, technical mentors) Camps – Host registration continues
June/ July / August	Competition – Registration continues. StellarCamps are conducted at host sites across the country. Contact local camp host organizations to recognize their participation in supporting STEM education or host a camp on behalf of your AFA Chapter.

September	Competition – Last big push for participation in National Space Design Competition. Follow up with interested schools and organizations to make sure they've started (or completed) the registration process.
October	Competition – Registration closes mid-October. Teams begin with Round 1 (Practice and Qualification)
November	Competition – Round 2 (Practice)
December	Competition – Round 2 (Qualification)
January	Competition – Round 3 (Practice Round and Qualification) Registration for StellarCamps opens Camps – Registration for hosting a StellarCamp beings. Encourage local schools or space organizations to host a summer camp.
February	Competition – Semifinal Round (top 64 teams) Camps – Host registration continues
March	Competition – Preparation for National Finals by STLX staff Camps – Host registration continues
April	Competition –National Finals Competition held for top 10 teams in Houston, TX. AFA members encouraged to attend. Camps – Host registration continues

- **Tell your StellarXplorers story.** Use your StellarXplorers involvement with local schools and youth organizations to tell your community how you are inspiring students to get more involved in STEM studies! This could include reaching out to media (media releases, letters to the editor, or local media appearances) or informing your congressional representatives about StellarXplorers successes. You can also submit your stories directly to StellarXplorers for a chance to be featured the STLX monthly newsletter
- **Ask for help:**
The StellarXplorers Program Office staff is happy to help support your efforts in any way it can. Staff members can be reached at info@stellarxplorers.org.

Steps for getting involved

Step 1: Familiarize yourself with the StellarXplorers competition

Before introducing StellarXplorers to prospective stakeholders, useful competition overview resources may be found at <https://www.stellarxplorers.org/competition>. Downloadable handouts are also available on the website: <https://www.stellarxplorers.org/outreach-materials>. Feel free to contact the StellarXplorers staff for clarification if you have any questions. Some key points to know:

- The competition is geared toward high school aged students, though middle school students are allowed to participate
- Teams must be registered by the October registration deadline (as listed on the website)
- The competition is conducted online from teams' home locations. No travel is required.
- Every team is guaranteed three rounds of competition, regardless of participation or performance in prior rounds.

- The competition begins in late October and goes through February (unless a team qualifies for National Finals, in which case they'll compete in April and an in-person event).
- **No prior space design experience is required.** Anybody with in interest in space and willingness to learn can join and be successful!

Step 2: Identify potential schools and teams

All high schools (public, private, parochial, charter, magnet, home schools, etc.) and approved youth organizations are eligible to participate. JROTC units and Civil Air Patrol squadrons are welcome to participate. The challenge is identifying an appropriate person within these institutions to approach. This is where we need your help!

AFA members recommending points of contact like a principal, district superintendent, or school STEM teacher, etc., would be very helpful. These folks may assist communication with faculty or staff interested in forming a StellarXplorers team. Best points of contact are typically engineering, science, technology, and computer science teachers. Also, many high schools have afterschool programs with school faculty points of contact.

In addition to schools, there are a variety of both in-school and out-of-school programs that are eligible to compete. These include but are not limited to Girl and Boy Scout Troops, 4-H clubs, and Boys' and Girls' clubs, and other nonprofit youth organizations.

After receiving your involvement interest and stakeholder suggestions, AFA StellarXplorers staff may provide you more information about:

- **Previous/Current StellarXplorers teams in your city, state, or region**
There are StellarXplorers teams across the nation who would greatly benefit from any additional technical mentor or promotional support.
- **Nearby service organizations**
StellarXplorers teams are often made up of high school students participating in JROTC, Civil Air Patrol, or the US Naval Sea Cadet Corps. Many of these service teams receive communication from their respective headquarters regarding StellarXplorers. However, there are many opportunities to introduce the program to these organizations' students.
- **Follow up communications with AFA Members & Chapters**
StellarXplorers staff will keep you informed of discussions and developments of StellarXplorers teams forming in your community.

If you know somebody who might be interested in developing a StellarXplorers team, encourage them to contact us at info@stellarxplorers.org.

Step 3: Recruit technical mentors

While each team has a designated Team Director as a coach, this person is not always an expert in aerospace engineering. StellarXplorers maintains a database of technical mentors who may volunteer to provide their aerospace expertise to requesting teams from time to time.

Ideas for recruiting technical mentors include:

- Solicit StellarXplorers mentors in your next AFA Chapter newsletter
- Reach out to local university aerospace departments

- Connect with aerospace industry organizations. Many of these organizations carry out volunteer service initiatives throughout the year, aiming to be active members of their community. StellarXplorers would be an excellent opportunity for such opportunities
- Become a mentor yourself!

If you know somebody who might be interested in becoming a StellarXplorers technical mentor, encourage them to write us at info@stellarxplorers.org.

Step 4: Maintain contact during the competition

An AFA member or unit may continue to support their local StellarXplorers throughout the competition season in a number of ways:

- Publicizing or recognizing the team
- Attending practice or competition sessions
- Coordinating facilities or meeting places
- Offering grants or financial assistance for entrance fees