

AeroAcoustic Research Consortium Research Proposal Guidelines

The objective of these guidelines is to help researchers align and structure their AARC research proposals with the interests of the AARC consortium members and thus maximize the potential that their proposal is selected for funding.

The mission of AARC is to pursue analytical, computational and experimental pre-competitive research leading to improved physical understanding of aircraft engine acoustics. A strong element in evaluating proposals is a clear linkage between the research and needs of the consortium members. These needs can be defined as:

- 1) Improved identification and characterization of aircraft noise sources and methods for their suppression that could lead to low noise designs on the part of AARC sponsoring organizations. Note that it is not the intent of the AARC to fund the independent development of devices and inventions.
- 2) New prediction techniques for aircraft engine noise.
- 3) Advanced experimental techniques for the measurement of engine noise.

The proposal should contain a clear definition of the deliverables from the research. These deliverables could include:

- 1) A detailed physical description or model of noise generation or suppression processes in an aircraft engine that advances the current state of understanding.
- 2) The detailed description of a new tool or technique for the prediction of aircraft engine noise.
- 3) The details of an advanced experimental process or procedure for measurement aircraft engine noise.

For each of these the data validating the correctness and accuracy of the model, tool or techniques is a required deliverable. The final deliverables are a matter of negotiation between the PI and the Peer Review Panel.

The proposal should also contain a clear and specific schedule associated with the deliverables defined.

Although a computer code may be a deliverable from the project, difficulties in implementing and supporting computer codes at the consortium members facilities have resulted in a detailed description of mathematics behind the code being a required deliverable. This description should include all elements of the technique (that are not already published in the open literature) in sufficient detail that the consortium members could implement an equivalent computer code themselves.

The consortium will consider proposals for pre-competitive research on any aspect of aircraft engine noise, however there is currently particular interest in research in the following areas. It is emphasized that the areas below are not expressed in any order of priority.

- The physical understanding and modeling of the generation and propagation of combustion noise in particular understanding of the relative importance of “direct” and “indirect” nature of combustor noise.
- The physical modeling of fan, tonal and broadband noise that accounts for the 3D flow in an aircraft engine fan.
- The robust, physics based modeling of acoustic and geometric effects on transmission capabilities through turbomachinery and nozzles.
- Low pressure turbine tone noise prediction that account for the multistage, 3D, compressible nature of the flow in these components.
- Improved physical understanding of the aero acoustics of acoustic liners that could lead to the design of liners with improved suppression characteristics.
- Understanding and modeling jet noise, including more complicated configurations, the role of large scale structures, modeling of shock cell noise, and also multistream nozzles.
- Noise related to counter-rotating, open rotor propfans.
- Advanced diagnostics and measurement techniques

It is the intention of the Aeroacoustics Research Consortium to promote mutually beneficial interaction between aeroacoustics researchers and Consortium sponsors, and to advance the state of the art in aeroacoustics research and technology. The focus of Consortium efforts and resources is on pre-competitive research and activities that are of benefit to Consortium members and ultimately the aeroacoustics community at large.

The Aeroacoustics Research Consortium is not intended to fund activities suitable for receiving support from other well-established sources; AARC funding should not be viewed as an alternative to funding from other organizations. A key criterion for a proposal to receive support will be the extent to which AARC funding would complement other funding sources and previous activities, maximizing the benefit to AARC sponsors. In instances where a PI proposes to leverage funding from other sources as well as the AARC, the PI should specify which portions of the effort or developed capabilities will be funded by each party. This is essential to determine rights in intellectual property for the Consortium.

It is not the intention of the Aeroacoustics Research Consortium to provide support for the development of a specific product ultimately intended for commercial sale. These efforts are more appropriately supported through

private capital investment or through programs designed to support commercialization.

Ownership of intellectual property developed through research funded by the Consortium resides with OAI, and Consortium members have substantial rights in licensing and sublicensing. For this reason, the Consortium discourages proposals requesting support for efforts intended to culminate in the development of a proprietary product that the proposer desires to retain exclusive rights to. As noted previously, the Consortium also requests that proposers intending to leverage multiple funding sources provide a specific breakdown of which party's funds will be used to support specific parts or results of the research effort.

Researchers should be prepared to submit any planned publications resulting from their work under the auspices of the AARC to the AARC's Peer Review Panel at least six weeks prior to formal submittal to external parties for publication consideration. This includes abstracts. There are no exceptions to this policy.

Researchers should be prepared to meet a minimum cumulative residency requirement of two weeks at NASA Glenn Research Center in Cleveland, Ohio and 1 day each at a location for each of the sponsor companies in the US and Europe (currently 5 companies total). Travel costs in proposals should reflect estimates that will accommodate the residency requirement. Sponsor companies are listed on the Consortium web page.

Researchers should provide clear plans to achieve their research deliverables. While the Consortium will consider efforts that are multi-year in scope, continued funding beyond year one is contingent upon performance in the first year of the effort. Thus, a clear scope of effort tied to a one-year time frame should be presented in the proposal. Requests for extensions to complete work are strongly discouraged and will be granted only on an exception basis by the Peer Review Panel.

Proposals should indicate a desired start and end date for the work described in the proposal. Typically the Consortium seeks proposals in January and June of each year. Proposers should refer to the AARC website, <http://www.oai.org/aeroacoustics/index.html>, for specific details.