

Opportunity Title: Examination of Additive Manufacturing and 3D Printing of Firearms and Tools

Opportunity Reference Code: ICPD-2021-18

Organization Office of the Director of National Intelligence (ODNI)

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How to Apply **Create and release your Profile on Zintellect** – Postdoctoral applicants must create an account and complete a profile in the on-line application system. **Please note: your resume/CV may not exceed 2 pages.**

Complete your application – Enter the rest of the information required for the IC Postdoc Program Research Opportunity. The application itself contains detailed instructions for each one of these components: availability, citizenship, transcripts, dissertation abstract, publication and presentation plan, and information about your Research Advisor co-applicant.

Additional information about the IC Postdoctoral Research Fellowship Program is available on the program website located at: <https://orise.orau.gov/icpostdoc/index.html>.

If you have questions, send an email to ICPostdoc@orau.org. Please include the reference code for this opportunity in your email.

Application Deadline 2/26/2021 6:00:00 PM Eastern Time Zone

Description **Research Topic Description, including Problem Statement:**

Rapidly growing numbers of firearms based on fabricated parts from additive manufacturing (AM) and three-dimensional printing (3DP) machines are challenging the ability of traditional forensic firearms/toolmark examinations to determine class and individual characteristics. With the proliferation of AM/3DP machines, lowering costs, and their increasing use in commercial manufacturing and in everyday home use, law enforcement will encounter parts and products produced by these machines. With these encounters, firearms/toolmarks examiners (FTE) will be asked to determine, if possible, the type and source for an AM part.

The currently limited understanding of nozzle manufacturing, toolmarks present, effects of wear, and life expectancy of AM/3DP-produced firearms by FTEs calls for more research into AM to determine if individual characteristics exist and persist and if they can provide evidence of a common source.

Example Approaches:

Utilization of traditional forensic firearms/toolmark examinations to determine class and individual characteristics from AM to determine a common source.

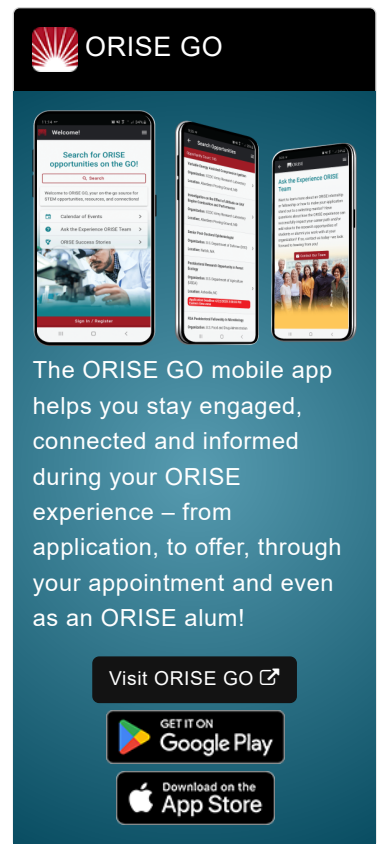
Relevance to the Intelligence Community:

With increased use of AM as a substitute for traditional manufacturing, the Intelligence Community will need to be able to recognize the method being utilized and potentially determine a common source (e.g., a specific nozzle produced an AM good, as determined by the persistence of individual characteristics from manufacturing toolmarks).

Key Words: Additive Manufacturing, 3D Printing, Fused Filament Fabrication (FFF), Fused Depositional Modeling (FDM), Material Extrusion, Nozzles, Toolmark Identification

Qualifications **Postdoc Eligibility**

- U.S. citizens only
- Ph.D. in a relevant field must be completed before beginning the appointment and within five



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years of the application deadline

- Proposal must be associated with an accredited U.S. university, college, or U.S. government laboratory
- Eligible candidates may only receive one award from the IC Postdoctoral Research Fellowship Program

Research Advisor Eligibility

- Must be an employee of an accredited U.S. university, college or U.S. government laboratory
- Are not required to be U.S. citizens

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
 - **Chemistry and Materials Sciences** ([12](#))
 - **Communications and Graphics Design** ([2](#))
 - **Computer, Information, and Data Sciences** ([16](#))
 - **Earth and Geosciences** ([21](#))
 - **Engineering** ([27](#))
 - **Environmental and Marine Sciences** ([14](#))
 - **Life Health and Medical Sciences** ([45](#))
 - **Mathematics and Statistics** ([10](#))
 - **Other Non-Science & Engineering** ([2](#))
 - **Physics** ([16](#))
 - **Science & Engineering-related** ([1](#))
 - **Social and Behavioral Sciences** ([27](#))