

### **W3. Enhancement of Latent Fingerprints on Metal Surfaces: Promoting student engagement through contextualised practical work**

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The uniqueness of an individual's fingerprints has long been recognized as a means of identification for authentication, for establishing the identities of victims of natural disasters, and for criminal investigations. As a consequence, any means of extending the capability to acquire fingerprint information is of considerable significance.

In this interactive workshop, a novel strategy for enhancement of latent fingerprints on copper and brass surfaces (bullet casings) will be demonstrated. Typically, enhancements of fingerprints from these types of surfaces have a low success rate. This new technology is based on enhancement of a fingerprint by electroless silver deposition from an ionic liquid. By a simple chemical process, visual contrast between the print and the substrate is obtained which is spatially selective, i.e. silver only deposits onto the metal surface between fingerprint ridges to generate a negative image of the fingerprint deposit.

This workshop will focus on how to deliver this experiment to students at different levels:

- It can be adapted to suit either a classroom activity / or hands-on lab-based activity.
- Adaptable for wide age range: Primary school – degree level.
- Suitable as a one session or multi-session activity.
- Instructions and resources will be made available.
- Examples of student feedback will be shared.

The session will be an opportunity to learn how to prepare the substrates, fingerprints and deposition solution, enhance latent fingerprints on real samples and match these to the Bandey Scale. The session will include examples of different experimental scenarios and discussion of the types of analysis that can be performed on samples. Participants do not require any previous laboratory experience. The fundamental experiment can be performed with basic materials and glassware. Extension to various levels of sophistication for students of STEM subjects will be discussed and the scope of the experiment will be illustrated through data obtained by modern analytical and imaging methods.

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