UNIDENTIFIED AEROSPACE PHENOMENA (UAP) AND EXPERIMENTAL STRATEGY: METHODS, EQUIPMENT AND LESSONS FROM INSTRUMENTED FIELD STUDIES

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1. BACKGROUND
- Since 1947, numerous UAP sightings have been documented using diverse measures (e.g. physical traces and effects, radar/dane coherence, visual footage).
- Although these diverse data have been acquired under controlled conditions with scientific instrumentation and have fail to provide sufficiently reliable evidence to convince the scientific community of the existence of anomalous aerial phenomena.
- To maximize the chances of acquiring reliable and valid data on the UAP phenomenon, instrument observations are essential, preferably coupled with visual observations.
- Field research can assist in obtaining quantitative data required to understand basic physical characteristics of UAP.
- As early as the 1950s, some attempts to detect and analyze UAP using scientific equipment have been carried out in the field in areas where anomalous aerial events were reported.
- Field research give support to the idea that the UAP phenomenon could be studied on a rigorous and empirical basis.

2. PURPOSE
- The purpose of this research is to explore the principal UAP instrumented field studies deployed during the last half-century. (1) (2) The main important results obtained, and (3) highlight the limitations and shortcomings in extant field research with the objective of refining future instrumented projects.

3. METHODS
- **Data Collection and Analysis**: We identified the main throughout review of the ufological literature, collected official declassified documents and interviewed researchers and project leaders.
- **Sample**: We considered all references to 26 instrumented field experiments implemented between 1950 and 2013, on 4 continents.
- **Method**: For each project, we analyze the different schemes procedures devised, the composition of the scientific instrumentation used, the results of the research and the most important results obtained. We also outline the main common difficulties and the lessons learned by the researchers.

4. KEY FINDINGS
- **Contrary to popular belief**, there have been many attempts at field measurement/detection of UAP and very few of them were predicated on an extraterrestrial visitor hypothesis.
- **Field experiments peaked in the 1970s and early 1980s**, then virtually disappeared in the 1990s. The decline may be attributable to the closure of the American project "Blue Book", the decrease of UAP sightings, the focus on other topics in the USA (e.g. Roswell, abduction) and the institutional and scientific climate gradually becoming less supportive of studying UAP.
- **An increase in the number of initiatives around the world (mainly in Europe) is evident since the 2000s**. Several long-term field projects continue into the new millennium, including the Project Hesdalen (Norway) running since 1994.
- **Civilian UAP researchers have attempted to use scientific instrumentation to measure and assess the UAP phenomenon**. They have deployed more equipment and in many areas than the few government projects that attempted similar research.
- **The majority of the systematic, instrumented efforts have been devoted to the study of "nocturnal lights" (also called "airlights")**. This kind of phenomenon is much more frequent than reported "undifferentiated structural aerial objects".

**Field Tactics**: Early projects centered on acquiring photographic evidence and the detection of fluctuations in magnetic fields, on the assumption that UAP were at least emitting some type of magnetic field (spinning of compasses has been described in some cases). Most projects that used a magnetic trigger used some type of magnetic detection, and this often led to too many false positives.

**Field Strategies**: UAPs do not appear everywhere. While some projects placed instruments at spots where UAP are more frequently seen (e.g. Marfa, 45°N, USA), others placed instruments where it was convenient (e.g. Opol, Starlight). The former had more success than the latter.
- **Advances in technology and informatics allowed the introduction of automatic unmanned observation stations (e.g. Hesdalen)**.
- **A "hit and run" strategy of moving the experts and instruments to a location where activity was previously observed has been successfully adopted by different projects (e.g. Project Identification, Operacao Prato)**.
- **Other innovative approaches have included attempts to "catch" the UAP phenomenon in the act. These have included camouflaging an automatic camera as an ordinary rock, quietly pre-positioning a network of observers in strategic places over an extended duration, and, in one case, attempting to trigger UAP activity over a specific location (alleged Russian military operation Ring-Koltso)**.

**Results**: For the most part, photographs and spectra data have been the most useful data collected by these projects, demonstrating unequivocally that aerial phenomena exist which cannot be conclusively identified.
- **Pictures have also been collected automatically (e.g. Marfa and Hesdalen)**.
- **Some success in recording other anomalous physical data has also been claimed (e.g. magnetic anomalies, radar correlation)**.

**Areas where "nocturnal light" activity occurred frequently (e.g. Yakima reservation, Marfa, Hesdalen) became outside "laboratories" for physical research, locations where scientific observations and measurements could be conducted with continuity.
- **Field work often used the same equipment despite small budget. As researchers suspected that the UAP phenomenon emitted radiation at several wavelengths and as technology became more powerful and affordable, new sensors sensitive to different wavelengths of the electromagnetic spectrum were added to the optical instruments (e.g. Toppenish, Starlight, Marfa)**.