This document presents profiles of two collaborating entities:

- ITTI Sp. z o. o.
- Astronomical Observatory of Adam Mickiewicz University

who are interested to contribute to the proposal to topic PROTEC-1-2015 “Passive means to reduce the impact of Space Debris” under the H2020 SPACE call.

Section 1 – Contact details

<table>
<thead>
<tr>
<th>OrganisationName (fullname)</th>
<th>ITTI Sp. zo.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisation acronym (Abbreviation)</td>
<td>ITTI</td>
</tr>
<tr>
<td>Address</td>
<td>ul. Rubież 46</td>
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<tr>
<td>Postal code</td>
<td>61-612</td>
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<tr>
<td>City</td>
<td>Poznań</td>
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<tr>
<td>Country</td>
<td>Poland</td>
</tr>
<tr>
<td>www address</td>
<td><a href="http://www.itti.com.pl">www.itti.com.pl</a></td>
</tr>
<tr>
<td>OrganisationName (fullname)</td>
<td>Astronomical Observatory of Adam Mickiewicz University</td>
</tr>
<tr>
<td>Organisation acronym (Abbreviation)</td>
<td>AO UAM</td>
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<td>Address</td>
<td>ul. Słoneczna 36</td>
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<td>Postal code</td>
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<td>Poland</td>
</tr>
<tr>
<td>www address</td>
<td><a href="http://www.astro.amu.edu.pl">http://www.astro.amu.edu.pl</a></td>
</tr>
</tbody>
</table>

**Contact person:**

| Title | Ph.D. |
| First Name | Joanna |
| Family Name | Modlawska |
| Telephone | +48 61622-69-85 |
| E-mail | joanna.modlawska@itti.com.pl |

Section 2 – Type of organization

ITTI Sp. z o. o.
Is your Company a Small-Medium sized Enterprise (SME)? ☑ YES ☐ NO

If YES, Number of Employees
☐ <10
☐ >10 and <50
☒ ≥250

Owned by a non SME: ☐ YES ☑ NO

Description of the organization (max 1,000 characters):

ITTI Sp. z o. o. is a private company, founded in 1996, fully owned by its partners, focused on consulting and applied research in IT and telecommunications. It is located in Poznań, Poland and has its offices in the Poznań Science and Technology Park of the Adam Mickiewicz University Foundation. ITTI has at present about 80 employees with professional certificates, e.g., PRINCE2 Certificate – Foundation and Practitioner (Projects IN Controlled Environments); ITIL Foundation Certificate (IT Service Management Best Practices); ITIL Service Manager Certificate; BS 7799 Certificate (Security); TOGAF 8; CISA Certificate; Auditor of Quality Management System based on ISO 9001:2008. ITTI company and the key personnel possess NATO and EU security clearance certificates.

The activities of ITTI can be grouped into three categories:
- development of innovative applications and software solutions – ITTI designs and develops innovative solutions which are adjusted to customer needs,
- technical consulting in the area of telecommunications and IT- ITTI assists the end-users (i.e., public administration, utilities, telecommunications) in purchasing, implementation and optimisation of IT and telecom systems,
- applied research in Information & Communication Technologies - ITTI has been working in EU Framework Programmes (5th, 6th, 7th), PASR, ESA programmes, EDA programmes and projects (e.g., "R&T Joint Investment Programme on Force Protection"), Action Grant CIPS II, NATO Industrial Advisory Group studies,
Description of the organisation (max. 1.000 characters):

The history of the Astronomical Observatory of Adam Mickiewicz University (OA AMU) in Poznan begins in 1919 shortly after Poland regained its independence after the First World War. The Observatory is a part of the Physics Faculty, with a staff of 35 persons including 20 researchers. From the very beginning our scientific activities covered the fields of astrometry and celestial mechanics. Lately the scientific research has been extended also to astrophysics. Education at the Observatory includes undergraduate and postgraduate studies in astronomy as well as introductory lectures for students of geography and physics.

Main research areas

- Dynamics of artificial satellites and space debris
- Laser and optical observations of artificial satellites
- Satellite geodesy
- Dynamics of Small Bodies in the Planetary System
- Dynamics of comets in the Oort Cloud
- Physical studies of asteroids
- Radial velocities of stars
- Stellar astrophysics:
  - Poznań Spectroscopic Telescope (Borowiec Observatory)
  - Global Astrophysical Telescope System (Winer Observatory in Arizona)

The Astronomical Observatory of the Adam Mickiewicz University has a long experience (about 35 years) in observations (optical, laser, Doppler and GPS) and in the orbital dynamics of artificial satellites and space debris.

The OA UAM contributed in several projects of the National Science Center, Poland, including projects related to the laser ranging and orbit determination of geodetic satellites, theories of orbital motion, and satellite and space debris dynamics. OA UAM participated in the first edition of the PECS Program for Poland realizing the PECS project No. 98088 entitled “Space debris observation and evolution predictions”. Currently the team is involved in the FP7 project CLEANSPACE (Small debris removal by Laser illumination and complementary technologies).

In the 80-ies, AMU started working in the determination of rotational periods, pole coordinates, senses of rotations and triaxial ellipsoid models, based on published lightcurves of asteroids. In 90-ies a small telescope (40-cm in diameter) equipped with a CCD camera was built and established at Borowiec Observational Station near Poznan. AO AMU has close cooperation with the SLR station in Borowiec near Poznan and participates in laser range observations of satellites and determination of satellite orbits. Since 2001, we are maintaining an asteroids spin axis database in our Observatory server, which is constantly kept up to date. It contains all the published results of asteroids spin and shapes determinations. We are also providing the so called ISAM (Interactive Service for Asteroid Models) a WWW public service which allows to generate simulated lightcurves and animate rotation of any asteroid with known model.

Section 3 – Sector of interest
**H2020 Space Programme**

**Call: PROTEC-1-2015**

<table>
<thead>
<tr>
<th>H2020 Programme</th>
<th>☒ Cooperation ☐ Ideas ☐ People ☐ Capacities</th>
<th>Type of programme:</th>
</tr>
</thead>
</table>

**Further information on the sector of interest**

(max. 500 characters)

- HORIZON 2020 WORK PROGRAMME 2014 – 2015
- 5. Leadership in enabling and industrial technologies - Space

**Research topic according to the work programme**

- PROTEC-1-2015 Passive means to reduce the impact of Space Debris

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### Section 4 - Description of expertise

**Description of the expertise**

(max 2,000 characters)

- ITTI Sp. z o. o.

  ITTI expertise:
  - User requirements and system design;
  - Front-end and back-end system implementation;
  - System validation and verification;
  - Areas: SpaceWire, HMI controls, and precise time;
  - Information management, mobile applications, decision support systems;
  - Integrated space components test platform;
  - Desktop and mobile application for asteroid follow-up observations;
  - Implementation and validation of the SpaceWire Protocol;

- **AO UAM**

  Main AO UAM research areas:
  - Dynamics of artificial satellites and space debris
  - Laser and optical observations of artificial satellites
  - Satellite geodesy
  - Dynamics of Small Bodies in the Planetary System
  - Dynamics of comets in the Oort Cloud
  - Physical studies of asteroids
  - Radial velocities of stars
  - Stellar astrophysics:
  - Poznań Spectroscopic Telescope
  - Global Astrophysical Telescope System

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### Section 5 – Previous experience

**Former participation in European projects?**

- ☒ YES ☐ NO
ITTI has contributed to the following selected EU R&D projects:

**European Space Agency:**
- PRECISETIME – Study on demand for precise and legal time services distributed via the Galileo system including development of research methodology;
- SPACEMAN – A SpaceWire network management tool;
- HMI – The technology framework for the development of modular, portable and adaptive Human-Machine Interfaces in ground segment software products;
- INSPECTOR – Integrated space components test platform;
- GAIA-GOSA – An interactive service for asteroid follow-up observations;
- SPACER – Implementation and validation of the SpaceWire Protocol;

**Framework Programmes for European Commission:**
- FP6 - DAIDALOS – Design Advanced Interfaces for the Delivery and Administration of Location independent Optimised personal Services;
- FP7 - ASPIS – Autonomous Surveillance in Public Infrastructure transport Systems;
- FP7 - N4C – Communications for Challenged Areas: Architecture, Test beds and Innovative Alliances;
- FP7 - SICMA – Simulation of Crisis Management Activities;
- FP7 - DaVinci – Design And Versatile Implementation of Non-binary wireless Communications based on Innovative LDPC codes;
- FP7 - ARENA – Architecture for the recognition of threats to mobile assets using networks of multiple affordable sensors;
- FP7 - INTERSECTION - INfrastructure for heterogenous, Resilient, SECure, Complex, Tightly Inter-Operating Networks;
- FP7 - PREDICT - PREparing for the Domino effect in Crisis siTuations (software to support crisis management with the use of “multi touch table”);

**European Defence Agency:**
- UAV simulation testbed;
- EDA - ATHENA - Asymmetric Threat Environment Analysis;
- EDA - AUDIS - Acoustic Urban Threat Detector for Improved Surveillance Capabilities;
- EDA - SIMS - Smart Information for Mission Success;

**National Projects:**
- Simulator for Crisis Situations - National project – INITECH programme;
- Protection of IT and communications networks from non-authorised activities;
- Model of threats for an agglomeration (incl. crisis management system) applied to the Warsaw case;
- System for fast creation of simulation applications for the needs of analysis and exercises;
- Development of a IT system for tax returns for the ENEA;
- PROCeed - Simulation environment for training on procedures in crisis situations.

AO UAM

The AO UAM contributed in several projects of the National Science
AO UAM participated in the first edition of the PECS Program for Poland realizing the PECS project No. 98088 entitled “Space debris observation and evolution predictions”.

Currently the team is involved in the FP7 project CLEANSPACE (Small debris removal by Laser illumination and complementary technologies).

The AO UAM team that will realize the proposed project is a part of the staff of the Astronomical Observatory which is an institute belonging to the Faculty of Physics of the Adam Mickiewicz University, Poznan, Poland.

AO AMU contributed to the following projects in the area Space Situational Awareness:

- PECS Project No. 98088 Space debris orbits - observation, determination and evolution (for ESA),
- FP7 CLEANSPACE Small debris removal by laser illumination and complementary technologies,
- 01/07/2000 – 30/06/2003, KBN nr 9 T12E 024 19: “Analysis of the geometrical coordinates changes of the laser station in Borowiec (7811)”,
- 01/01/1997 – 21/12/1999, KBN nr 9 T12E 02 012: “Kinematics changes of the ITRF 12205 point coordinates through laser metering”,
- 01/02/2001 – 30/05/2004, KBN nr 8 T12E 028 20: “Motion of the artificial satellites of the Earth and other planets – theory and practice”,
- 01/01/1995 - 31/12/1997, KBN nr 2 P03C 006 08: “Space Derbis – dynamics and orbital evolution of natural and artificial matter in the circumterrestrial space”,
- 01/03/1993 - 31/12/1995, KBN nr 2 z6z6 012 03p06: ‘Planets’ gravitational Fields and artificial satellites and space probes motion.

<table>
<thead>
<tr>
<th>Activities performed</th>
<th>☑️ Research ☑️ Demonstration ☐ Training ☑️ Technology ☑️ Dissemination ☑️ Management ☐ Other:</th>
</tr>
</thead>
</table>

Please describe briefly your role in the project (max. 700 characters):

ITTI role:
Partner

AO UAM role:
Partner
In respect to the Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 Right of the Protection of Personal Data, we authorize the use of our personal data.