



# ESAIL D80.1

## Public Outreach Report

Work Package: **WP 80**

Version: **Version 1.0**

Prepared by: Finnish Meteorological Institute,  
Sini Merikallio

Time: Helsinki, March 18<sup>h</sup>, 2013

Coordinating person: Sini Merikallio, Sini.Merikallio@fmi.fi

(List of participants:)

Participant no.	Participant organisation	Abbrev.	Country
1 (Coordinator)	Finnish Meteorological Institute	FMI	Finland
2	University of Helsinki	UH	Finland
3	University of Jyväskylä	UJ	Finland
4	German Aerospace Center	DLR	Germany
5	Ångström Space Technology Centre	ÅSTC	Sweden
6	Nanospace AB	Nanospace	Sweden
7	Tartu Observatory	Tartu	Estonia
8	University of Pisa	Pisa	Italy
9	Alta S.p.A.	Alta	Italy

## Table of Contents

<b>1. Introduction</b> .....	<b>2</b>
<b>2. Outreach activities</b> .....	<b>2</b>
2.1 Scientific peer-reviewed publications.....	2
2.2 Scientific conference presentations.....	3
2.3 Public talks.....	3
2.4 Popular press.....	4
2.5 Web presence.....	4
2.6 Television and radio.....	4
2.7 Press releases.....	5
<b>3. Webpages</b> .....	<b>5</b>
<b>4. Discussion and conclusions</b> .....	<b>5</b>
<b>Appendix A, Dissemination activities listed</b> .....	<b>6</b>

## 1. Introduction

All of the participants of the E-sail project have taken part in dissemination activities. This document summarises these efforts. It has to be noted that the summaries are from activities that have taken place before mid-November 2013. However, interest is increasing with the advancing technology and thus many media exposures and scientific publications loom in the future. All reported dissemination activities are listed in Appendix A. In this document we give an overview of the main categories of the reported activities.

## 2. Outreach activities

During the three years of E-sail project, there have been a constant stream of dissemination activities directed to both scientific as well as to the wider audience. Summarized here are reports on these activities categorized by the type of activity.

### 2.1 Scientific peer-reviewed publications

University of Pisa, Finnish Meteorological Institute and University of Helsinki have published parts of their work and findings in scientific peer-reviewed publications. These papers produced are listed here:

1. Quarta, A.A. and G. Mengali, [Electric sail mission analysis for outer solar system exploration](#), J. Guid. Contr. Dyn., 33, 740-755, 2010.

2. Quarta, A.A. and G. Mengali, [Electric sail missions to potentially hazardous asteroids](#), Acta Astronaut., 66, 1506-1519, 2010.
3. Quarta, A.A., G. Mengali and P. Janhunen, [Optimal interplanetary rendezvous combining electric sail and high thrust propulsion system](#), Acta Astronaut., 68, 603-621, 2011.
4. Janhunen, P., P.K. Toivanen, J. Polkko, S. Merikallio, P. Salminen, E. Haeggström, H. Seppänen, R. Kurppa, J. Ukkonen, S. Kiprich, G. Thornell, H. Kratz, L. Richter, O. Krömer, R. Rosta, M. Noorma, J. Envall, S. Lätt, G. Mengali, A.A. Quarta, H. Koivisto, O. Tarvainen, T. Kalvas, J. Kauppinen, A. Nuottajärvi and A. Obraztsov, [Electric solar wind sail: Towards test missions \(Invited article\)](#), Rev. Sci. Instrum., 81, 111301, 2010.
5. Merikallio, S. and P. Janhunen, [Moving an asteroid with electric solar wind sail](#), Astrophys. Space Sci. Trans., 6, 41-48, 2010.
6. Janhunen, P., [Status report of the electric sail in 2009](#), Acta Astronaut., 68, 567-570, 2011.
7. Seppänen, H., Kiprich, S., Kurppa, R., Janhunen, P. and Haeggström, E., [Wire-to-wire bonding of um-diameter aluminum wires for the Electric Solar Wind Sail](#), Microelectronic Engineering, 88, 3267-3269, 2011.
8. Mengali, G., Quarta, A. and Aliasi, G., [A graphical approach to electric sail mission design with radial thrust](#), Acta Astronaut., 82, 197-208, 2013.
9. Quarta, A., G. Mengali and P. Janhunen, [Electric sail for near-Earth asteroid sample return mission: case 1998 KY26](#), J. Aerospace Eng., in press, 2012.
10. Janhunen, P., [Photonic spin control for solar wind electric sail](#), Acta Astronaut., 83, 85-90, 2013.
11. Toivanen, P. and P. Janhunen, [Spin plane control and thrust vectoring of electric solar wind sail by tether potential modulation](#), J. Prop. Power, 29, 178-185, 2013.
12. Janhunen, P., A. Quarta and G. Mengali G., [Electric solar wind sail mass budget model](#), Geosci. Instrum. Method. Data Syst., 2, 85-95, 2013.
13. Janhunen, P., [Electric sail, photonic sail and deorbiting applications of the freely guided photonic blade](#), Acta Astronaut., in press, 2013.
14. Seppänen, H., T. Rauhala, S. Kiprich, J. Ukkonen, M. Simonsson, R. Kurppa, P. Janhunen and E. Haeggström, [One kilometer \(1 km\) electric solar wind sail tether produced automatically](#), Rev. Sci. Instrum., 84, 095102, 2013.

The papers themselves can be found on project web-pages, <http://www.electric-sailing.fi>

## 2.2 Scientific conference presentations

The E-sail has been topic in 24 scientific presentations, talks and posters, taking part all over the world, namely Cyprus, Finland, France, Czech Republic, India, Caribbean islands, Sweden, Italy, Spain and USA. Presentations have thus reached a wide array of scientifically, politically and technologically inclined audience.

There have also been 17 presentations for a more restricted audience or in a more informal seminar series etc.

## 2.3 Public talks

Public talks have been listed in Appendix A both as “Oral presentations to a wider public” and as “Presentations” with a “Civil Society” as the target audience. Together there are twelve of these. Attendances range from 20 to 250, mean audience size being 80 people.

## 2.4 Popular press

There have been 17 popular press articles on E-sail. Some of them have been quite visible. Swedish popular science, industry and technology magazines “New Teknik”, “Allt om vetenskap”, “Dagens Industri” and “Forskning och Framsteg” have together reached over three million reader contacts, which is quite laudable in a country with less than ten million inhabitants. It is impossible to estimate the number of people reached, as the reader pools of these types of publications overlap.

The Finnish press also noted the project very well with “Helsingin Sanomat”, “Tekniikan Maailma”, “Turun Sanomat” and “Uusimaa” among others, resulting in over a 3.5 million reader contacts in a country of five million inhabitants. Also Estonian main papers have published several stories on E-sail and moreover the Estonian public is also often influenced by the Finnish press.

## 2.5 Web presence

This chapter centers on the web presence the project had on the pages of outside actors, namely media. Projects own webpages are discussed in greater detail in Section 3.

Nowadays almost all of the print media is also publishing an on-line version of their papers. It can be estimated that these exposures have bought the project the greatest amount of public contacts. As an example in Figure 1 the main page of the homepages of the major Finnish Newspaper, Helsingin Sanomat, is shown. The E-sail was the main story reaching over a million people.



Fig. 1 Electric Solar Wind Sail was portrayed in a four page article in the main morning newspaper of Finland, Helsingin Sanomat, in October 19<sup>th</sup> 2013. The same story was the main news also on the websites of the newspaper and shown in the picture is the screenshot of this.

## 2.6 Television and radio

Scientists working on the E-sail project have been interviewed in the radio programs in Finland, Sweden and Estonia. There has also been an interview in the prime-time main channel television shows in both Estonian and Finnish television.



Fig. 2 A screen shot from the Finnish prime-time television show (“Puoli seitsemän”, 1.5.2012), where the size of the full-scale E-sail was compared with the size of the Helsinki region in an effort to demonstrate the huge size of the device.

## 2.7 Press releases

Five press releases have been issued on the project subjects by Finnish Meteorological Institute and Universities of Helsinki and Uppsala.

## 3. Webpages

The webpages of the project were situated at <http://www.electric-sailing.com/fp7>. Amounts of visitors to the domain [www.electric-sailing.com](http://www.electric-sailing.com) were followed. Total number of visitors for the duration of the project was over 42 000, often spiking around media exposures. Of all of these visits 17 500 came from direct links (not a search engine query). Over half however found the pages based on search queries such as “esail”, “electric sailing” and “solar wind sail”.

The page was visited from 30 different countries world-wide. Majority of the web-page visits, 6500, came from Finland. United States was somewhat surprisingly the second with 2700 visitors. After these came Estonia (2100), Italy (900), France (800), Germany (700) and United Kingdom (700). Also, from Asia there was a total of 1500 site visits.

## 4. Discussion and conclusions

The lower limit for the number of direct individual public contacts can be crudely estimated to be over ten million. Overall, the subject of E-sail is very interesting in the view of general public and the interest from press has been constant. However, for the reporters the subject often seems to be elaborate to approach as some studying and understanding would be required to avoid misconceptions. For this reason media contacts have required quite a considerable time and input from the team members on reviewing the draft versions of the

stories and educating the press.

Main bulk of the media publicity has been centred on Finland, but the project has been featured quite visibly also in Sweden, Estonia and Germany. Italy has been very strong on scientific dissemination, publishing a lot in scientific papers.

## Appendix A

List of Dissemination activities that have been reported to the EU SESAM Grant management portal. Items are the same, but here they have been organized by their dates. Sizes of the audiences are often approximate and largely based on the amount of readers given by the publishers or the individuals being responsible for the activity. Total number of the activities listed here is 108.

Type of activity	Main leader	Title	Date	Place	Type of audience	Size of audience	Countries addressed
Presentations	Finnish Meteorological Institute	Development of electric solar wind sail propellantless propulsion for solar system access	8.12.2010	Brussels, FP8-SPACE Hearing Event	Industry - Policy makers	300	All European
Press releases	Finnish Meteorological Institute	EU project to build Electric Solar Wind Sail	9.12.2010	Finnish Meteorological Institute	Medias	1000	All
Interviews	Finnish Meteorological Institute	Estonian TV interview ("Pealtnägija" show, 10 min)	10.12.2010	Finnish Meteorological Institute	Civil society	500000	Estonia
Publication	University of Helsinki	Wire-to-wire bonding of um-diameter aluminum wires for the Electric Solar Wind Sail	1.1.2011	Microelectronic Engineering, 88, 3267-3269, 2011	Scientific community (higher education, Research)		International
Presentations	Finnish Meteorological Institute	Electric solar wind sail technology	9.2.2011	Tartu Observatory Science Center	Scientific community (higher education, Research) - Policy makers - Medias	80	Estonia
Articles published in the popular press	Finnish Meteorological Institute	Popular article in "Tekniikan Maailma" (World of Technology)	18.2.2011	Most popular big audience technology magazine of Finland, "The world of Technology"	Civil society	551000	Finland
Presentations	University of Uppsala	Presentation for the university's Division of Microsystems Technology	1.3.2011	Uppsala, Sweden	Scientific community (higher education, Research)	30	Sweden
Publication	University of Pisa	Optimal Interplanetary Rendezvous Combining Electric Sail and High Thrust Propulsion System	1.3.2011	Acta Astronautica	Scientific community (higher education, Research)		International

Presentations	Finnish Meteorological Institute	Talk in URSA seminar series	15.3.2011	Helsinki, Finland	Civil society	50	Finland
Presentations	Finnish Meteorological Institute	Talk in URSA seminar series	22.3.2011	Helsinki, Finland	Civil society	50	Finland
Presentations	Finnish Meteorological Institute	Talk in Finnish Geophysical Societys meeting	22.3.2011	Helsinki, Finland	Scientific community (higher education, Research) - Civil society	30	Finland
Presentations	Finnish Meteorological Institute	Talk in URSA seminar series	30.3.2011	Helsinki, Finland	Civil society	50	Finland
Presentations	University of Uppsala	presentation for ÅSTC steering committee	1.4.2011	Uppsala, Sweden	Scientific community (higher education, Research) - Policy makers	20	Sweden
Articles published in the popular press	Finnish Meteorological Institute	Long interview of E-sail scientists	10.4.2011	Uusimaa newspaper	Civil society	120000	Finland
Presentations	University of Pisa	Electric sail performance with purely radial thrust	13.4.2011	Italy, Pisa, Department of Aerospace Engineering	Scientific community (higher education, Research)	35	Italy
Presentations	Finnish Meteorological Institute	Public talk of E-sails possibilities	17.4.2011	Helsinki, Finland	Civil society	20	Finland
Articles published in the popular press	Finnish Meteorological Institute	Article on E-sail technology	18.4.2011	Tähdet and Avaruus (Stars and Space), the most popular astromagazine of nordic countries	Civil society	75000	Finland
Organisation of Conference	University of Pisa	Electric Sail Mass Breakdown for High-Energy Missions	28.4.2011	Torino, Italy	Scientific community (higher education, Research)	100	Italy
Oral presentation to a wider public	Finnish Meteorological Institute	Oasis of Excellence, Innovation seminar	14.5.2011	Caribbean	Industry	40	USA, Finland



Publication	University of Pisa	A Graphical Approach to E-sail Mission Design with Radial Thrust	11.7.2011	A Paper submitted to 7th Symposium on Realistic Advanced Scientific Space Missions	Scientific community (higher education, Research)		International
Organisation of Conference	University of Pisa	presentation for 7th IAA Symposium on Realistic Near-Term Advanced Scientific Space Missions	12.7.2011	Aosta, Italy	Scientific community (higher education, Research)	40	International
Publication	University of Pisa	"Artificial equilibrium points for a generalized sail in the circular restricted three-body problem"	12.7.2011	Article in Celest. Mech. Dyn. Astr.	Scientific community (higher education, Research)		International
Thesis	University of Pisa	Electric Sail mass breakdown model	12.7.2011	University of Pisa, Faculty of Engineering, Italy	Scientific community (higher education, Research) - Civil society	40	Italy
Organisation of Workshops	University of Helsinki	Multifilament Tether for Electric Solar Wind Sail	14.7.2011	IMAPS Workshop on Wire Bonding, San Francisco, USA	Scientific community (higher education, Research)	100	International
Organisation of Conference	Finnish Meteorological Institute	"2011 Electric Solar Wind Sail: Discovering solar system further and faster"	2.9.2011	FinCospar conference, Kemiö, Finland	Scientific community (higher education, Research)	50	Finland
Articles published in the popular press	Finnish Meteorological Institute	Aalto-1, story on Finland's first satellite and its payload	3.9.2011	Turun Sanomat, regional newspaper	Civil society	250000	Finland
Interviews	Tartu Observatory	Eesti esimese tudengisatelliidi ehitus edeneb jõudsalt	6.9.2011	Raadio Elmar, <a href="http://www.elmar.ee/index.php?pid=4&amp;lang=1&amp;nid=438">http://www.elmar.ee/index.php?pid=4&amp;lang=1&amp;nid=438</a>	Civil society		Estonia
Web sites/Applications	Tartu Observatory	Koos tudengisatelliidiga valmib ka uus missioonijuhtimistarkvara	13.9.2011	<a href="http://teadus.err.ee/artikkel?id=5183&amp;cat=1">http://teadus.err.ee/artikkel?id=5183&amp;cat=1</a>	Civil society		Estonia
Presentations	University of Pisa	Mission Applications for Low-Thrust Spacecraft Configurations	23.9.2011	University of Pisa, Faculty of Engineering, Italy	Scientific community (higher education, Research)	80	Italy
Presentations	University of Uppsala	Talk for two highschool classes from Uppsala	3.10.2011	Uppsala, Sweden	Civil society	60	Sweden
Presentations	University of Uppsala	presentation for ÅSTC steering committee	3.10.2011	Uppsala, Sweden	Policy makers	20	Sweden

Posters	Finnish Meteorological Institute	Sailing with E-Sail to the outer planets	3.10.2011	European Planetary Science Conference EPSC, Nantes, France	Scientific community (higher education, Research)	500	International
Posters	Finnish Meteorological Institute	Jupiter, Saturn, Uranus and Neptune; gas giants one launch away	4.10.2011	European Planetary Science Conference EPSC, Nantes, France	Scientific community (higher education, Research)	500	International
Publication	University of Uppsala	Embedded i rymden	4.10.2011	Elektronik i Norden, <a href="http://www.elinor.se/index.php/Dow">http://www.elinor.se/index.php/Dow</a>	Scientific community (higher education, Research) - Industry	10000	Sweden
Articles published in the popular press	Finnish Meteorological Institute	"Sailing to the edges of our solar system" - newspaper story	5.10.2011	Kouvolan Sanomat, regional newspaper	Civil society	70000	Finland
Posters	Finnish Meteorological Institute	Asteroid touring mission with Electric Solar Wind Sail	6.10.2011	European Planetary Science Conference EPSC, Nantes, France	Scientific community (higher education, Research)	500	International
Publication	Finnish Meteorological Institute	Electric solar wind sail propulsion system development	11.11.2011	International Electric Propulsion Conference IEPC-2011-058, Wiesbaden, Germany	Scientific community (higher education, Research)		International
Articles published in the popular press	Finnish Meteorological Institute	interview of an ESAIL -scientists	5.1.2012	APU -magazine	Civil society	180000	Finland
Presentations	University of Uppsala	presentation for ÅSTC steering committee	16.1.2012	Uppsala, Sweden	Policy makers	20	Sweden
Presentations	Finnish Meteorological Institute	Presentation for Rotary eClub	24.1.2012	International online talk broadcasted from Helsinki, Finland	Civil society - Policy makers	200	All
Press releases	University of Uppsala	University of Uppsala utvecklar miniatyrfarkost för gigantiskt rymdsegel	7.3.2012	<a href="http://www.uu.se/press/pressmeddelanden/pressmeddelanden-visning/?id=1615&amp;area=3&amp;typ=pm&amp;na=&amp;lang=sv">http://www.uu.se/press/pressmeddelanden/pressmeddelanden-visning/?id=1615&amp;area=3&amp;typ=pm&amp;na=&amp;lang=sv</a>	Medias		Sweden
Web sites/Applications	University of Uppsala	University of Uppsala utvecklar miniatyrfarkost för gigantiskt rymdsegel	7.3.2012	Forskning ( <a href="http://www.forskning.se">www.forskning.se</a> )	Civil society	100000	Sweden
Organisation of Workshops	Finnish Meteorological Institute	Electrostatic plasma brake for satellite deorbiting	24.4.2012	SOSTC AIAA, Improving Space Operations Workshop, Jet Propulsion Laboratory, Pasadena, USA	Scientific community (higher education, Research) - Industry	200	International

TV clips	Finnish Meteorological Institute	Sähköpurjehdusta avaruudessa – (E-sailing in space)	01.05.12	YLE television broadcast, <a href="http://www.youtube.com/watch?v=WJ4yB6ow3hE">http://www.youtube.com/watch?v=WJ4yB6ow3hE</a>	Civil society	500000	Finland
Publication	Finnish Meteorological Institute	Space Research in Finland, report to COSPAR 2012	1.7.2012	Printed report, download available at <a href="http://www.cospar.fi">www.cospar.fi</a>	Scientific community (higher education, Research) - Industry - Civil society - Policy makers	5000	International
Organisation of Conference	Finnish Meteorological Institute	PIC simulation of Electric Sail with explicit trapped electron modelling	13.7.2012	ASTRONUM-2011, Valencia, Spain, June 13-17, ASP Conf. Ser. 459, 271, 2012	Scientific community (higher education, Research)		International
Organisation of Conference	Finnish Meteorological Institute	Electric Solar Wind Sail (E-sail) mission to asteroids	15.7.2012	39th COSPAR Scientific Assembly, Mysore, India	Scientific community (higher education, Research)	200	International
Articles published in the popular press	University of Uppsala	Uppsala bygger pyttelit segelskepp för rymden	21.8.2012	Dagens industri	Industry - Civil society	2000000	Sweden
Organisation of Conference	Finnish Meteorological Institute	Attitude dynamics analysis of Aalto-1 satellite during de-orbiting experiment with Plasma Brake	1.10.2012	63rd Int. Astronautica. Congress, Naples, Italy, Oct 1-5 2012, IAC-12-B4.2.11, 2012.	Scientific community (higher education, Research) - Industry		International
Organisation of Conference	Finnish Meteorological Institute	Possibilities opened by electric solar wind sail technology	1.10.2012	63rd Int. Astronautica. Congress, Naples, Italy, Oct 1-5 2012, IAC-12-D4.1.4, 2012	Scientific community (higher education, Research)		International
Web sites/Applications	University of Uppsala	Uppsalas ”ängströmar” ökar farten i rymden	1.10.2012	Cassiopeiabloggen No 53, <a href="http://www.astb.se/cassiopeiabloggen/?p=28401">http://www.astb.se/cassiopeiabloggen/?p=28401</a>	Civil society	200	Sweden
Publication	University of Pisa	Artificial Equilibrium Points for a Generalized Sail in the Elliptic Restricted Three-Body Problem	1.10.2012	Celestial Mechanics and Dynamical Astronomy	Scientific community (higher education, Research)		International
Publication	Finnish Meteorological Institute	Spin plane control and thrust vectoring of electric solar wind sail by tether potential modulation	1.11.2012	J. Prop. Power, in press, 2012	Scientific community (higher education, Research)		International
Publication	University of Pisa	A graphical approach to electric sail mission design with radial thrust	1.11.2012	Astronautica, in press, 2012	Scientific community (higher education, Research)		International

Publication	University of Pisa	Electric sail for near-Earth asteroid sample return mission: case 1998 KY26	1.11.2012	J. Aerospace Eng., in press, 2012	Scientific community (higher education, Research)		International
Web sites/Applications	University of Uppsala	Fråga Uppsala!	1.11.2012	Cassiopeiabloggen No 54, 2012 <a href="http://www.astb.se/cassiopeiabloggen/?p=28447">http://www.astb.se/cassiopeiabloggen/?p=28447</a>	Civil society	200	Sweden
Organisation of Conference	Finnish Meteorological Institute	2nd EU Space Conference	16.11.2012	Larnaca, Cyprus	Scientific community (higher education, Research) - Industry - Policy makers	60	International
Web sites/Applications	Tartu Observatory	Eesti oma tehiskaaslane pole kogukam, kui leivapäts	23.11.2012	Maaleht <a href="http://maaleht.delfi.ee/">http://maaleht.delfi.ee/</a>	Civil society		Estonia
Presentations	Finnish Meteorological Institute	Electric sail and plasma brake for efficient interplanetary propulsion and satellite deorbiting	30.11.2012	Finnish Meteorological Institute - UK Space Agency Colloquium	Scientific community (higher education, Research) - Industry - Policy makers - Medias	100	Finland, UK
Interviews	University of Uppsala	Jättesnabb farkost ska segla på solvinden	1.12.2012	Swedens radio, <a href="http://sverigesradio.se/sida/gruppsida.aspx?programid=4131&amp;grupp=18801&amp;artikel=5364728">sverigesradio.se/sida/gruppsida.aspx?programid=4131&amp;grupp=18801&amp;artikel=5364728</a>	Civil society	1000000	Sweden
Web sites/Applications	Tartu Observatory	Tudengisatelliit ESTCube - 1 leidisriigikogus tunnustust	21.12.2012	<a href="http://teadus.err.ee/artikkel?cat=1&amp;id=8147">http://teadus.err.ee/artikkel?cat=1&amp;id=8147</a>	Civil society		Estonia
Web sites/Applications	Tartu Observatory	Tudengisatelliit ESTCube - 1	29.12.2012	<a href="http://www.ohtuleht.ee/501334">http://www.ohtuleht.ee/501334</a>	Civil society		Estonia
Publication	Finnish Meteorological Institute	Photonic spin control for solar wind electric sail	1.1.2013	Acta Astronautica, 83, 85-90, 2013	Scientific community (higher education, Research)		International
Publication	Finnish Meteorological Institute	Electric solar wind sail mass budget model	1.1.2013	Geoscientific Instrumentation, Methods and Data Systems journal	Scientific community (higher education, Research)		International
Publication	University of Helsinki	One kilometer (1 km) electric solar wind sail tether produced automatically	1.1.2013	Review of Scientific Instruments, vol. 84, no. 9	Scientific community (higher education, Research)		International
Web sites/Applications	Tartu Observatory	Eestlased on oma satelliidi orbiidile saatmisele väga lähedale jõudnud	5.1.2013	forte.delfi.ee	Civil society		Estonia

Press releases	University of Helsinki	1km of E-sail tether produced	7.1.2013	University of Helsinki press release	Civil society - Medias		Finland
Publication	Finnish Meteorological Institute	Electric sail, photonic sail and deorbiting applications of the freely guided photonic blade	10.1.2013	Acta Astronautica	Scientific community (higher education, Research)		International
Articles published in the popular press	Tartu Observatory	Tudengisatelliit läbib tugevusproovi	10.1.2013	Tartu Postimees <a href="http://www.tartupostimees.ee/1098692/tudengisatelliit-labib-tugevusproovi">http://www.tartupostimees.ee/1098692/tudengisatelliit-labib-tugevusproovi</a>	Civil society		Estonia
Web sites/Applications	Tartu Observatory	Eesti esimene satelliit on valmimas	14.1.2013	<a href="http://teadus.err.ee/artikkel?cat=1&amp;id=8237">http://teadus.err.ee/artikkel?cat=1&amp;id=8237</a>	Civil society		Estonia
Web sites/Applications	Tartu Observatory	Eesti satelliit püsib graafikus	17.1.2013	<a href="http://www.teadus.ee/?p=4475">http://www.teadus.ee/?p=4475</a>	Civil society		Estonia
Articles published in the popular press	Tartu Observatory	Jaak Kilmi: film Eesti satelliidist saab olema kriiside ajalugu	19.1.2013	<a href="http://www.ohtuleht.ee/507024">www.ohtuleht.ee/507024</a>	Civil society		Estonia
Web sites/Applications	Tartu Observatory	VIDEO ja FOTOD: Eesti esimese satelliidi EstCube viimane esitlus enne telesaatomist	21.1.2013	<a href="http://forte.delfi.ee/">http://forte.delfi.ee/</a>	Civil society	50000	Estonia
Web sites/Applications	Tartu Observatory	PRESSITEADE: Eesti kosmosesatelliit ESTCube-1 asub teele stardipaigale	21.1.2013	<a href="http://forte.delfi.ee/">http://forte.delfi.ee/</a>	Civil society	50000	Estonia
Organisation of Conference	University of Helsinki	Automatic 4-wire Heytether production for the electric solar wind sail	22.1.2013	International Microelectronics Assembly and Packing Society Topical Workshop and Tabletop Exhibitio	Scientific community (higher education, Research) - Industry	300	International
Web sites/Applications	Tartu Observatory	Ülevaade ESTCube-1 missioonist	24.1.2013	<a href="http://teadus.err.ee">teadus.err.ee</a>	Civil society	5000	Estonia
Presentations	Finnish Meteorological Institute	Sailing in the solar system - presentation for finnish MENSA	7.2.2013	Hotel Arthur, Helsinki	Civil society - Policy makers	30	Finland
Oral presentation to a wider public	University of Uppsala	Stora krav på det lilla ... – mikroteknik för krävande miljöer, särskilt rymden	13.2.2013	Tekniska föreningen , Sweden	Civil society	20	Sweden
Articles published in the popular press	University of Helsinki	Article on 1km E-sail tether production	1.3.2013	Tähdet and Avaruus - magazine 2/2013	Civil society	75000	Finland

Interviews	University of Helsinki	How do one experiment the E-sail?	12.3.2013	Tiede -magazine 3/2012	Civil society	290000	Finland
Posters	University of Helsinki	Quality assured tether for electric solar sail	12.3.2013	Physics days 2013	Scientific community (higher education, Research)	200	Finland
Web sites/Applications	Finnish Meteorological Institute	The remote unit succesfully tested in the laboratory	25.3.2013	www.verkkouutiset.fi	Civil society - Medias	30000	Finland
Web sites/Applications	University of Helsinki	Breakthrough for the finnish E-sail: "Now we can manufacture the sail"	25.3.2013	http://www.uusisuomi.fi/comment/546383	Civil society - Medias	300000	Finland
Web sites/Applications	University of Uppsala	Elektriskt solvindssegel ett steg närmare målet	25.3.2013	www.forskning.se	Scientific community (higher education, Research) - Civil society	100000	Sweden
Web sites/Applications	University of Uppsala	University of Uppsala med och tillverkar rymdsegel	25.3.2013	http://evertiq.se/news/26084	Civil society	9999	Sweden
Press releases	Finnish Meteorological Institute	Sähköpurjeen etäyksikköä testattiin onnistuneesti laboratoriossa	25.3.2013	Finnish Meteorological Institute press release	Medias	1000	Finland
Press releases	University of Uppsala	Electric solar wind sailing spacecraft an important step closer	25.3.2013	Uppsala University press release	Medias	1000	Sweden
Web sites/Applications	Finnish Meteorological Institute	Finnis electric sail got a remote unit.	26.3.2013	http://www.avaruus.fi/uutiset/kantoraketit-ja-satelliitit/suomalainen-sahkopurje-sai-etayksikon.html	Civil society	3000	Finland
Articles published in the popular press	Finnish Meteorological Institute	Wild vision: Finnish invention could save us from a 8.5 megaton explosion.	27.3.2013	Uusi Suomi newspaper and www-page	Civil society - Policy makers	300000	Finland
Articles published in the popular press	University of Uppsala	Uppsalaforskare hissar solsegel	28.3.2013	Forskning och framsteg, http://fof.se/tidning/2013/5/artikel/uppsalaforskare-hissar-solsegel	Industry - Civil society	500000	Sweden
Articles published in the popular press	Finnish Meteorological Institute	Finnish Electric sail heading towards space on board an Estonian satellite.	1.4.2013	Helsingin sanomat	Civil society - Policy makers	1000000	Finland

Articles published in the popular press	University of Uppsala	Uppsala hissar solsegel	16.4.2013	Ny Teknik, <a href="http://www.nyteknik.se/nyheter/fordon_motor/rymden/article3676922.ece">http://www.nyteknik.se/nyheter/fordon_motor/rymden/article3676922.ece</a>	Industry - Civil society	500000	Sweden
Web sites/Applications	Tartu Observatory	ESTCube-1 ja Robotexi meeskond pälvis ITL-i aastaauhinna	29.4.2013	<a href="http://www.ut.ee/et/uudised/estcube-1-robotexi-meeskond-palvis-itl-i-aastaauhinna">http://www.ut.ee/et/uudised/estcube-1-robotexi-meeskond-palvis-itl-i-aastaauhinna</a>	Civil society	10000	Estonia
Articles published in the popular press	Tartu Observatory	Ergma jälgib Prantsuse Guajaanas Estcube-1 starti	1.5.2013	Postimees, an Estonian news paper	Civil society	200000	Estonia
Publication	University of Pisa	Trajectory Approximation for Low-Performance Electric Sail with Constant Thrust Angle	1.5.2013	Journal of Guidance, Control, and Dynamics	Scientific community (higher education, Research)		International
Web sites/Applications	Tartu Observatory	Electric Space Sail to Get Its First Test	2.5.2013	<a href="http://spectrum.ieee.org/tech-talk/aerospace/astrophysics/electric-space-sail-to-get-its-first-test">http://spectrum.ieee.org/tech-talk/aerospace/astrophysics/electric-space-sail-to-get-its-first-test</a>	Scientific community (higher education, Research)	100000	International
Press releases	University of Helsinki	E-Sailing at last! (EstCube launch successful)	7.5.2013	University of Helsinki press release	Civil society - Medias		Finland
Publication	Tartu Observatory	New satellite sail is propelled by solar protons	7.5.2013	New Scientist	Civil society	300000	International
Oral presentation to a wider public	University of Uppsala	Mikro- & nanoteknik för krävande miljörer	31.5.2013	Uppsala, group visits to university facilities	Civil society	200	Sweden
Articles published in the popular press	University of Uppsala	Medvind för elektriskt solsegel	25.6.2013	Allt om vetenskap	Civil society	135000	Sweden
Oral presentation to a scientific event	University of Helsinki	Space Tether Produced to Strength Specification.	21.7.2013	International Ultrasonics Symposium (IUS), 21-25 July 2013, Prague, Czech Republic	Scientific community (higher education, Research)	100	International
Oral presentation to a scientific event	University of Helsinki	Determining the Quality of Space Tether in a Nondestructive manner	21.7.2013	International Ultrasonics Symposium (IUS), 21-25 July 2013, Prague, Czech Republic	Scientific community (higher education, Research)	100	International
Posters	University of Helsinki	Determining the quality of space tether in a nondestructive manner	21.7.2013	UFFC 2013, Prague	Scientific community (higher education, Research)	200	International
Oral presentation to a scientific event	University of Helsinki	Space Tether produced to Strength Specification	22.7.2013	UFFC 2013, Prague	Scientific community (higher education, Research)	200	International

Oral presentation to a scientific event	Finnish Meteorological Institute	Uranus and Neptune: ice giants one launch away	18.9.2013	Uranus Workshop, Meudon Observatory, Paris, France	Scientific community (higher education, Research)	90	International
Oral presentation to a scientific event	Finnish Meteorological Institute	Uranus and Neptune to be Scouted by E-sail	20.9.2013	FinCospar Conference, Vantaa, Finland	Scientific community (higher education, Research)	80	Finland, USA, Netherlands
Oral presentation to a wider public	Finnish Meteorological Institute	With a rover to Mars and an E-sail to Saturn - public talk in finnish	5.10.2013	Science Fare Center Heureka, Vantaa, Finland	Civil society	250	Finland
Articles published in the popular press	Finnish Meteorological Institute	E-sail might help in asteroid conquest	19.10.2013	Helsingin Sanomat (the main daily news paper of Finland), also main news in online paper	Civil society	1000000	Finland