

# Information Societies Technology (IST) Programme

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ASTRALS



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### *Dissemination Strategy and Workplan*

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Abstract: Strategy and workplan for the dissemination of the ASTRALS project results are described in this document at the end of the first period (1.1.2006 – 31.12.2006).



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2	ST Microelectronics	ST	Contractor	Italy
3	Thomson	Thomson	Contractor	France
4	Mitsubishi Electric	Mitsubishi	Contractor	UK
5	Telefonica I + D	TID	Contractor	Spain
6	ProVision Communication Technologies	ProVision	Contractor	UK
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## Abbreviations

<b>AVC</b>	<i>Advanced Video Coding</i>
<b>ICT</b>	<i>Information and Communication Technologies</i>
<b>MANET</b>	<i>Mobile Ad-hoc Network</i>
<b>MIMO</b>	<i>Multiple Input Multiple Output</i>
<b>SoC</b>	<i>System-on-Chip</i>
<b>SVC</b>	<i>Scalable Video Coding</i>
<b>WiFi</b>	<i>Wireless Fidelity</i>
<b>WiMAX</b>	<i>Worldwide Interoperability for Microwave Access</i>
<b>WLAN</b>	<i>Wireless Local Area Network</i>



## Executive Summary

In this document dissemination strategy and work plan for ASTRALS project results are described. Regarding past activities, section 2.1 refers to the first project period from 1.1.2006 – 31.12.2006. It also gives some information about planned activities for the remaining lifetime of the project in section 2.4. Each of these two sections is preceded by an overview table. A more detailed description follows, structured according to the means of dissemination, i.e. different media for publication such as journals, conferences, seminars or trade fairs.

There have already been a significant number of publications during the first term of the project, and this activity will continue through the second year. The list of future publications included in this document is not an exhaustive list. Additional contributions to conferences or journal papers will be submitted, answering respective calls for papers.



## 1. Dissemination Strategy

ASTRALS is a project that is performing innovative work in a number of areas including:

- **Stream Optimized Wireless Distribution** including IEEE 802.16 toolbox, MIMO and ad-hoc aspects
- **Scalable Video Coding** including extensions for file format and signaling
- **Smart Home environment** and media processing and finally
- **Intelligent Home Surveillance** applications

We believe that a large number of research and technology institutes and organizations, and a large number of industries and SMEs may be interested in the achievements of ASTRALS project. Thus the project has introduced the following channels to disseminate the project results:

- **Documentation:** Both internal and public documents are foreseen. The former are circulated inside the project as soon as the involved partners, workpackage leaders and the technical manager have declared their consent. The public ones are made available via the project web site.
- **Publications:** This is dissemination channel, includes selected journals, scientific or targeted publications, bulletin, conferences and workshops. ASTRALS has prepared a number of scientific publications and promotional materials for external people (professionals and researchers). The intent is clearly to enlarge awareness of the technology and applications being experimented to enlarge the potential recipients of the message and increase the number of interested people.
- **Access through WWW:** An Internet WWW site ([www.ist-astrals.org](http://www.ist-astrals.org)) has been developed from the very start of the project, whose main objective is to diffuse the ASTRALS's objectives and results as wider as possible, throughout the community and over.
- **Brochure:** A brochure and a presentation for the project have been prepared to reflect the project's progress. The brochure is available at ASTRALS web site and is distributed in a number of events.
- **Access through events:** This includes workshops, conferences, seminars, demonstrations and any other activity, which leads to the involvement of different spectrum of audiences from different backgrounds. The ASTRALS consortium is active in the organisation of targeted demonstrations, participation and contribution to relevant conferences. With this in mind, regular and well-attended events such as European and non- European exhibitions and trade shows will be considered as suitable for ASTRALS demonstration and dissemination. Below is a list of international events to be considered in the dissemination process.
- **Standardization:** ASTRALS is also dissemination knowledge via contributions to standards. ASTRALS consortium has played a very concise and concrete schedule for contributions in the relevant standards. As it is described in ASTRALS deliverable D.7.4.1, a number of contributions to standards have been submitted and more are already scheduled.

In the following sections will describe in more details the project dissemination activities, strategy and planned activities.



## 2. Dissemination Workplan

### 2.1. ASTRALS Web Site

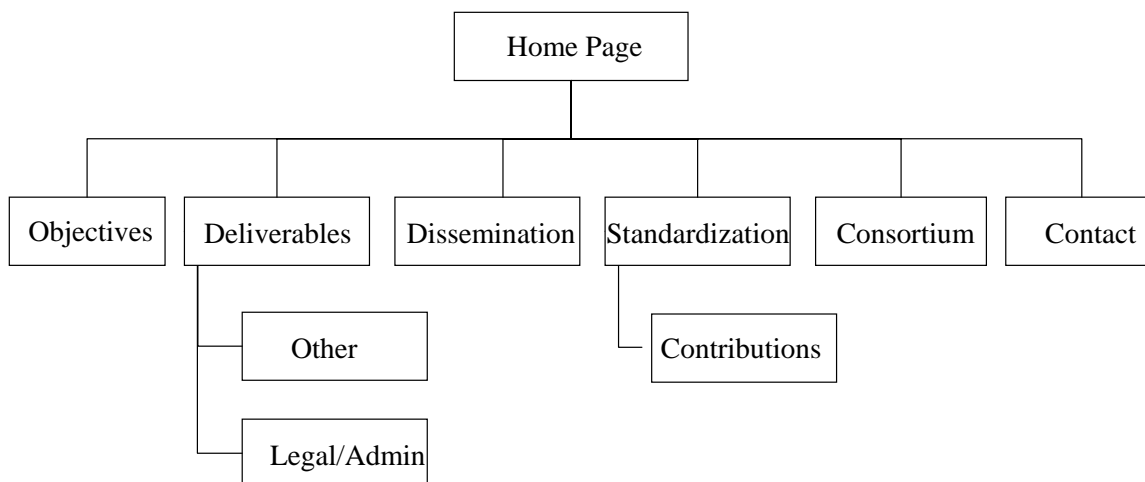
The ASTRALS web site is located at the following address: <http://www.ist-astrals.org>



Figure 1. ASTRALS web site home page



The structure of the web site is the following:



**Figure 2. ASTRALS web site structure**

The ASTRALS “*Home Page*” describes the overview of the project and offers the main web navigation buttons. It also declares that ASTRALS (IST-028097) is an Information Society Technologies (IST) project co-funded under EU's sixth framework (FP6).

The “*Objectives*” page gives an overview of the ASTRALS project objectives.

The “*Deliverables*” page provides the project public and confidential document deliverables of the project. In case of public deliverable, the visitor can directly download it, but clicking on the relevant hyperlink. In case of confidential deliverable, the visitor is prompted for a login and password information.

The “*Deliverables*” page provides access to two additional pages:

- a) Under the name “*Other*” is a page that contains the non-document deliverables. This is public or confidential software and description of platforms.
- b) Under the name “*Legal/Admin*” is a page, where the project legal and/or administrative documentation is located.

The “*Dissemination*” page contains the magazine and conference papers of the project.

The “*Standardization*” page gives an overview of the standards that ASTRALS aims to address. This page also gives access to another page that contains the actual ASTRALS contributions to the relevant standards.

Finally, the “*Consortium*” and “*Contact*” pages give information about the ASTRALS consortium and contact details.

## **2.2. IST NAVS Concertation Meeting**

ASTRALS was represented in the NAVS concertation meeting October 24-25, 2006. ASTRALS Project Manager, Dr. Theodore Zahariadis presented the projects’ major objectives and achievements in the workshop plenary.

As a follow up activity, a potential standardization form was prepared and seven forms were completed concerning ASTRALS standardization related activities and future activities.



## 2.3. Past activities

Overview table – past activities (details see next chapters)

Date	Type	Type of audience	Countries addressed	Size of audience ♣	Partner responsible / involved
2006- 2007	Website [1]	General public, Research, Industry	Worldwide	N/A	Algosystems / all
2006	Brochure [2]	General public, Research, Industry	Worldwide	N/A	Algosystems
4-8 June 2006	IST Mobile & Wireless Communications Summit paper [5]	Research, Industry	Worldwide		Mitsubishi
19-23 June 2006	EUSEA ICT Conference paper [6]	Research, Industry	Worldwide		I2R
19-24 August 2006	ICPR Conference papers [7], [8]	Research, Industry	Worldwide		I2R
18-20 September 2006	Invited Conference Paper MobiMedia 2006 [9]	Research, Industry	Worldwide		HHI
21-23 September 2006	IWSSIP'06 Conference paper [10]	Research, Industry	Worldwide	120	Algosystems, HHI, I2R
October 2006	IEEE Wireless Communications Magazine article [3]	Research, Industry	Worldwide		Mitsubishi
October 2006	IEEE Wireless Communications Magazine articles [4]	Research, Industry	Worldwide		HHI
November 2006	Telecom I+D conference [11]	Research, Industry	Spain	100	TID
November 2006	Innovation Seminar [12]	Research	Spain, Mexico, Brazil,	50	TID

\* **NOTE:** audience estimates for the conference papers included in the table above include not only the direct audience (conference attendees) but also those persons who can have access to the conference proceedings in research institutes, libraries (or through the internet). Similarly, figures for journal papers and book chapters include not only the direct audience (journal subscribers, book buyers) but all those people who can potentially have access to these journals/books through libraries.



- [1] The ASTRALS Consortium Web Site <http://www.ist-astrals.org/index.htm> is maintained by the project coordinator Algosystems. It gives an overview on the ASTRALS objectives, and it provides access to all public deliverable and other publications of the project.
- [2] A leaflet for the ASTRALS project has been issued which will be used to communicate the objectives of the project at any appropriate occasion, such as conferences or concertation meetings attended by the partners.

### 2.3.1. Publications in journals and magazines

- [3] Sarris, A.Nix, A.Doufexi, “[High-Throughput Multiple-Input Multiple-Output Systems for In-Home Multimedia Streaming](#),” IEEE Wireless Communications Magazine, October 2006, pp.60-66

Abstract: Wireless communication systems based on Multiple-Input Multiple-Output (MIMO) technology have the potential to achieve increased spectral efficiency with no additional transmit power or bandwidth requirements. This can be achieved by exploiting the spatial subchannels between the multiple transmit and receive elements. The enhanced performance of MIMO technology makes it a strong candidate for ad-hoc systems requiring very high throughput, such as high-definition multimedia streaming in the home. In this article we compare the performance of conventional and newly proposed MIMO architectures for such applications. Specifically designed antenna arrays are proposed as a solution to significantly reduced MIMO performance in Line-of-Sight (LoS) conditions. To help in the design of such systems the criterion for achieving maximum MIMO capacity in LoS is presented as a function of the transmitter-to-receiver separation distance, the array orientation and the element spacings. The performance of the LoS enhanced proposal and the conventional system is quantified in terms of the channel capacity, the Packet Error Rate (PER) and the throughput by employing a MIMO-enabled WLAN physical layer simulator. The results from MIMO measurements performed inside an anechoic chamber and in an indoor environment are presented to validate the theoretic predictions.

- [4] Th. Schierl, K. Gänger, C. Hellge, Th. Stockhammer, and Th. Wiegand, “[SVC-Based Multi-Source Streaming For Robust Video Transmission in Mobile Ad-Hoc Networks](#),” IEEE Wireless Communications Magazine, October 2006, pp. 96-103

Abstract: Emerging non-infrastructure based network types like Mobile Ad-Hoc Networks (MANETs) are becoming suitable platforms for exchanging/sharing real-time video streams, because of recent progress in routing algorithms, throughput and transmission bit-rate. MANETs are characterized by highly dynamic behavior of the transmission routes and path outage probabilities. In this article a multisource streaming approach is presented to increase the robustness of real-time video transmission in MANETs. For that, video coding as well as channel coding techniques on the application layer are introduced, exploiting the multisource representation of the transferred media. Source coding is based on the scalable video coding (SVC) extension of H.264/MPEG4-AVC with different layers for assigning importance for transmission. Channel coding is based on a novel unequal packet loss protection (UPLP) scheme, which is based on Raptor forward error correction (FEC) codes. While in the presented approach, the reception of a single stream guarantees base quality only, the combined reception enables playback of video at full quality and/or lower error rates. Furthermore, an application layer protocol is introduced for supporting peer-to-peer based multisource streaming in MANETs.

### 2.3.2. Presentations at conferences

- [5] Sarris, A. Doufexi, A. Nix, “*High-Performance WLAN Architectures Using MIMO Technology in Line-of-Sight*,” 15<sup>th</sup> IST Mobile & Wireless Communications Summit, Mykonos, 4-8 June 2006



Abstract: This paper investigates the Packet-Error-Rate (PER) and throughput performance of WLANs in Line-of-Sight (LoS) conditions. A novel antenna array architecture is proposed as a way of overcoming the problem of excessive correlation under these conditions. The performance of systems designed with the proposed method is assessed by means of link-level simulations using channels generated from an appropriate stochastic Multiple-Input Multiple-Output (MIMO) channel model. The results are validated using MIMO measurements at 5.2 GHz in an anechoic chamber and in an indoor office environment. Our study shows that a very substantial performance enhancement is possible, compared to standard MIMO arrays of small spacing (on the order of one wavelength), when the proposed architecture is employed. The difference between the modeled and measured cases was less than 0.5 dB at a PER of 10<sup>-2</sup>.

- [6] TK. Chiew, “*The Challenges of A/V Streaming in Smart Homes,*” EUSEA (Euro-Southeast Asia) ICT Conference, 19-23 June 2006, Singapore

We presented an overview of the components required in Smart Home in the next generation, focusing on the transport of video over wireless networks within a home and throughout a community. ASTRALS was introduced to the audience as a test-bed.

- [7] Alex Chia, Weimin Huang and Liyuan Li, “*Multiple Objects Tracking with Multiple Hypotheses Graph Representation,*” accepted in International Conference on Pattern Recognition 2006 (ICPR 2006), 19-24 August 2006, Hong Kong

We presented a novel multi-object tracking algorithm based on multiple hypotheses about the trajectories of the objects. Our work is inspired by Reid’s multiple hypotheses tracking algorithm which is an optimal solution to the motion correspondence that occurs in multi-object tracking. Unfortunately, the exponential growth of the hypotheses tree precludes practical applications. To restrict this growth, many approximations relying on a series of clustering and pruning operations have been proposed. The decisions for these operations are based solely on previous observations and are not guided by observations in later frames. We show that due to multiple splits and merges, relying solely on previous observations to guide these operations may inadvertently eliminate the correct hypothesis. Consequently, this leads to poor tracking performance. To overcome this problem, we determine the validity of a hypothesis by exploiting information in later frames and relating them to previous observations. Experimental results demonstrate the robustness & efficiency of our approach.

- [8] Ya-Dong Wang, Jian-Kang Wu, Ashraf A. Kassim, and Wei-Min Huang, “*Tracking a Variable Number of Human Groups in Video Using Probability Hypothesis Density,*” accepted in International Conference on Pattern Recognition 2006 (ICPR 2006), 19-24 August 2006, Hong Kong

We apply a multi-target recursive Bayes filter, the Probability Hypothesis Density (PHD) filter, to a visual tracking problem: tracking a variable number of human groups in video. First, we use background subtraction to detect human groups which appear as foreground blobs. The PHD filter is implemented using sequential Monte Carlo methods; and the centroids of the foreground blobs are used as the measurements to update the PHD filter. Our experimental results show that when human groups appear, merge, split, and disappear in the field of view of a camera, our method can track them correctly.

- [9] Thomas Schierl et al., “*Video Streaming in Mobile Ad Hoc Networks,*” MobiMedia 2006, 18-20 September 2006, Alghero, Sardinia, Italy, invited paper.

Emerging Mobile Ad-Hoc Networks (MANETs) which do not need access points, but rely on peer-to-peer connections, are becoming suitable platforms for exchanging or sharing real-time video streams due to recent progress in routing algorithms, throughput and transmission bit-rate. In this paper, a multi-source streaming approach is presented to increase the robustness of real-time video transmission in MANETs which are characterized



by highly dynamic behavior of the transmission routes and path outage probabilities. Video coding as well as channel coding techniques on application layer are introduced exploiting the multi-source representation of the transferred media. Source coding is based on the Scalable Video Coding (SVC) extension of H.264/MPEG4-AVC. Channel coding is based on a new Un-equal Packet Loss Protection (UPLP) scheme, which is based on Raptor forward error correction codes. Furthermore, an application layer protocol is introduced for supporting peer-to-peer based multi-source streaming in MANETs.

- [10] Th. Zahariadis, K. Grüneberg and TK Chiew, “Efficient Home Video Surveillance Platform” 13<sup>th</sup> International Conference on Systems, Signals and Image Processing (IWSSIP’06), Budapest, Hungary, 21-23 September 2006, pp.143-146

The paper initially, presents the envisaged home network architecture and the surveillance application requirements. Then it describes the video coding requirements and outlines the necessary main A/V sub-system capabilities. However, the design decision of the system architecture is not based only on technical facts. Techno-economical criteria have also been taken into account to provide an abstract system architecture and specification.

- [11] A paper titled “Plataforma de Streaming para el Ocio y para el Ocio en el Hogar” has been submitted to the Spanish conference Telecom I+D (<http://www.telecom-id.com>) held from 29<sup>th</sup> November to 1<sup>st</sup> of December 2006.

### 2.3.3. Trade fairs and exhibitions

In 2006, there have not yet been activities of the ASTRALS project on trade fairs or exhibitions, as it has been too early to present the intermediate results at such occasions.

### 2.3.4. Seminars

- [12] A seminar was held in TID the 13<sup>th</sup> of November where the project objectives and activities were presented to the research community of Telefonica. The seminar was held in Madrid and broadcasted to all centers in Spain. See the figure below with the published announcement.



Figure 3 Seminar Web Page at TID.



## 2.4. Future activities

Overview table – future activities (details see next chapters)

Planned Date	Type	Type of audience	Countries addressed	Size of audience ♣	Partner responsible / involved
2006-2007	Website [1] (see section 2.1)	General public, Research, Industry	Worldwide	N/A.	Algosystems / all
2007	Casadomo website article [13]	General public, Research, Industry	Spain	<i>(The most popular website in Spain for Digital Home Technologies)</i>	TID
2007	,Information Society of Telefonica website article [14]	General public, Research, Industry	Spain	<i>(Public Portal about ICT from The Telefonica Group)</i>	TID
2007	ASTRALS Workshop [15]	Research, Industry	Europe	t.b.d.	all
2007	Net-atHome Conference 2007 [16]	Research, Industry	Worldwide	170	All
2007	Telecom I+D[17]	Research, Industry	Spain	100	TID
Jan/Feb 2007	VCIP [18]	Research, Industry	Worldwide	300	I2R/All
Apr 2007	VTC conference [19]	Research, Industry	Worldwide		Mitsubishi
June 2007	ICOST [20]	Research, Industry	Worldwide	150	I2R/All
Jul 2007	IST Summit conference [21]	Research, Industry	Worldwide		Mitsubishi
Sep 2007	PIMRC conference [21]	Research, Industry	Worldwide		Mitsubishi

\* **NOTE:** audience estimates for the conference papers included in the table above include not only the direct audience (conference attendees) but also those persons who can have access to the conference proceedings in research institutes, libraries (or through the internet). Similarly, figures for journal papers and book chapters include not only the direct audience (journal subscribers, book buyers) but all those people who can potentially have access to these journals/books through libraries.



Planned Date	Type	Type of audience	Countries addressed	Size of audience ♣	Partner responsible / involved
2007	Journal Papers [22]	Research, Industry	Worldwide		Mitsubishi, all
Jan 2007	Trade show in the context of CES, Las Vegas [23]	Industry	Worldwide		STM
Sep 2007	IBC Amsterdam [24]	Broadcasters, Industry	Worldwide	40,000	HHI
Nov 2007	SIMO trade fair [25]	General Public, Industry	Spain, Europe	200,000	TID

#### 2.4.1. Web Sites

- [13] The Casadomo Website <http://www.casadomo.com/> is the reference in the Spanish Digital Home sector where all sort of information can be found from research down to commercial links in the domain of various technologies in the Home Automation, Installation, Energy and Multimedia fields.
- [14] The Website <http://www.telefonica.es/sociedaddelainformacion/> of the Information Society of Telefonica is a good window to the market and innovation activities being promoted in the field. The scope is very wide and is a very good tool to view Technical developments w.r.t. ICT in the world in general.

#### 2.4.2. Workshop

- [15] The ASTRALS project will arrange a public workshop in order to present project results and support the scientific exchange with other research groups. Preferably, this workshop will be coordinated with other projects in the same domain or attached to a conference in order to reach a bigger audience. The details will be planned during the first months of 2007. The workshop will probably take place during the second half of 2007.

#### 2.4.3. Conferences

- [16] Net-atHome is the most important conference in Europe for the Home Domain:

"It is the **only event in Europe**, and one of the few worldwide, that covers **the entire Connected Home domain** (it is not limited to a particular technology, standard, country or market segment), thus giving participants an excellent overall understanding of the domain (multi-sector by nature) and of its markets (global by nature)"

- [17] Telecom I+D is a 16 years old conference with a very important participation from the Spanish industry and research organisations in the field of Information and Communication Technologies.
- [18] VCIP is a conference on Visual Communications and Image Processing devoted to image processing and communication. VCIP has become a leading forum for the presentation of fundamental research results and technological advances in the field of visual communication and image processing. The following conference paper will be published on VCIP 2007:

Xinguo Yu et al, "*Trajectory-Based Ball Detection and Tracking with Aid of Homography in Broadcast Tennis Video*".



Abstract: Ball-detection-and-tracking in broadcast tennis video (BTV) is a crucial but challenging task in tennis video semantics analysis. Informally, the challenges are due to camera motion and the other causes such as the presence of many ball-like objects and the small size of the tennis ball. The trajectory-based approach proposed by us in our previous papers mainly counteracted the challenges imposed by causes other than camera motion and achieves a good performance. This paper proposes an improved trajectory-based ball detection and tracking algorithm in BTV with the aid of homography, which counteracts the challenges caused by camera motion and bring us multiple new merits. Firstly, it acquires an accurate homography, which transforms each frame into the “standard” frame. Secondly, it achieved higher accuracy of ball identification. Thirdly, it obtains the ball projection position in the real world, instead of ball location in the image. Lastly, it also identifies landing frames and positions of the ball. With the intent of using homography to improve the video-based event detection for smart home we also do some experiments on acquiring the homography for home surveillance video.

- [19] A conference paper has been submitted by Mitsubishi on the VTC 2007 Spring Conference. This contains information about the measurement activities of WP2.3.1.
- [20] ICOST, the International Conference on Smart Homes and Health Telematics, focuses on smart home related research. 2007 conference is focusing on development of an active research community dedicated to explore how Smart Homes and Health Telematics can foster independent living and offer an enhanced quality of life for ageing and people with disabilities
- [21] Conference papers will be submitted by Mitsubishi for the IST summit and the PIMRC conference.

#### **2.4.4. Journal papers**

- [22] A journal paper will be submitted in 2007 from Mitsubishi. This will contain the results from the measurements performed in WP2.3. A comparison will be made between the performance of 802.11 (WiFi) and 802.16 (WiMAX) systems in the home environment. Moreover, Mitsubishi will try to collaborate with the other partners in WP2 to produce a non-technical article that will be submitted in a suitable magazine publication.

Other journal or magazine papers are not yet planned in detail, but will be submitted corresponding to various calls for papers during the second period of the ASTRALS project.

#### **2.4.5. Trade fairs and exhibitions**

- [23] STM System research group plans to present the work performed in ASTRALS as part of real-time demonstrators on current System-on-Chip (SoC) and related reference boards on international trade shows to raise awareness of the technology by all the market players. This includes current SoC targeted as digital TV HD decoders or portable multimedia players.
- [24] The IBC — world of content creation, management and delivery — is a most important event in the domain of content production and broadcast. There is a huge exhibition attached to an annual conference in the Amsterdam RAI Congress center (in 2006: over 1200 companies, about 45,000 visitors). The exhibition takes place from 7 to 11 September 2007. We will show receiver technology for scalable video coding.
- [25] SIMO is the most important trade fair in Spain about data, communication and multimedia technologies. The fair takes place in the Madrid Exposition Centre with more than 65,000 m<sup>2</sup> of trade space for the different companies. (In 2006: 772 companies, 285,742 visitors) <http://www.ifema.es/ferias/simo/default.html>)



### **3. Conclusion**

ASTRALS has been actively disseminating its results already during the first year of the project's life time. First results have been published through journal papers as well as by presentations at important conferences.

More results will be achieved in the second year of the project, and ASTRALS will continue its dissemination activities. Some of the publications are already submitted or planned in detail, but others will emerge during the next period.