

CURRICULUM VITAE

SURNAME AND NAME	Massotti Luca
Home Address	
Phone number	
Fax number	
E-mail address	
Nationality	Italian
Birth date	

Working experience (please use the following table in order to briefly describe the working positions covered by the candidate)

Dates	August 2007 - Present
Name and address of the Employer (Public or/and private institution/body)	<i>RHEA System B.V.</i> consultant at <u>ESA/ESTEC – EOP-SFP</u> Jonckerweg 18, 2201 DZ, Noordwijk ZH, The Netherlands
Position held (for positions in Universities, the candidate should indicate the Faculty/College/School and the Department)	Future Studies Payload and Spacecraft Design Engineer
Main activities/responsibilities	<ul style="list-style-type: none"> - Support to the preparation of Earth Observation missions in the areas of spacecraft and payload design, performance analysis and system aspects (detailed satellite configuration, mass and power specifications, AOCS, data link, P/F trade-off analysis). - Support to missions under preparations throughout participation to TEBs, writing/contributing to SOWs and AC papers, submitting and reviewing of ideas for the TRP Call for Ideas, GSTP proposals, participation to the ESA Harmonization program and interactions with delegates for work plan justifications, management of relevant TEC support. - Pre-Phase A studies concerning Next Generation Gravity Mission (NGGM): <ul style="list-style-type: none"> <i>Laser Interferometry High Precision Tracking for LEO</i>: assistant system engineer <i>System Support to Laser Interferometry Tracking Technology Development for Gravity Field Monitoring - Assessment of a Next Generation Gravity Mission to Monitor the Variations of Earth's Gravity Field</i>: instrument design, payload performance analysis and system design <i>Consolidation of the system concept for NGGM</i> - Phase 0 study (deputy TO) <ul style="list-style-type: none"> <i>CAI gravity gradiometer sensor</i>: preliminary

design and accommodation

Appointed as **member** of Inter-Agency Working Groups between ESA & NASA, and ESA & Chinese institutions

Earth Explorer Missions programme:

- Phase A/B1 of *Biomass* (Earth Explorer 7 Core mission) project: accommodation, interface and control of the large P-band SAR payload
- *FLEX* (Earth Explorer 8 Opportunity mission): **AOCS responsible**. Accommodation and performance of the payload (imager spectrometer), system and AOCS design
- Conception, coordination and preparation of innovative AOCS design in support to the Biomass Phase A system studies: *Modern attitude control of Earth Observation satellites with large flexible elements*

- Actively involved in the ESA **TRP/GSTP** programs (up to TRL 6) for:

Laser metrology (for TEC-MME)

High-stability Laser with Fibre Amplifier + Laser Stabilization Unit (LSU) for Interferometric Earth Gravity Measurements (TRL 5)

C.O.A.T.S. instrument design and test

Electric propulsion (for TEC-MPE)

Direct characterization of mini-RIT performance on Nanobalance, Miniaturized GIE breadboarding & testing

Development of a miniaturized Gridded Ion Engine subsystem for Euclid and NGGM (TRL 5)

mN-FEEP design and qualification

AOCS and INR (for TEC-ECC)

AOCS and Image Navigation and Registration for EO from GEO

Next Generation Gravity Mission: AOCS Solution and Technologies

Actuators technology (for TEC-MSM)

Qualification of a Magnetic Bearing momentum wheel

Design review and qualification of the mini CMG 4-6 S

- System engineer for the GEO High Resolution (**GEO-HR**) mission study:

Telescope (VIS) design and performance

optimization of GEO platforms, structural and power trade-offs, thermal

	<p>control design, impact of mechanisms on pointing stability, AOCS and propulsion design based on EP</p> <p>consolidation of the INR & AOCS requirements, managing industrial studies</p> <p>collaboration with MTG</p> <p>Science projects: Herschel ACMS Independent Validation Team, QWEP, STE-QUEST and PROBA 3 (Phase B1&C)</p>
Dates	October 2015 - Present
Name and address of the Employer (Public or/and private institution/body)	<i>RHEA System B.V.</i> Jonckerweg 18, 2201 DZ, Noordwijk ZH, The Netherlands
Position held (for positions in Universities, the candidate should indicate the Faculty/College/School and the Department)	Service Manager
Main activities/responsibilities	<ul style="list-style-type: none"> - Effective support of in-scope technical services at ESA - Responsible of 2 employees: engineering support on Cold Atom Interferometry for Future Missions and on Bistatic SAR Mission Definition
Dates (from .. to..)	July 2005 – July 2007
Name and address of the Employer (Public or/and private institution/body)	<i>ESA/ESTEC – EOP-SF</i> Keplerlaan 1, PO Box 299 NL-2200 AG Noordwijk, The Netherlands
Position held (for positions in Universities, the candidate should indicate the Faculty/College/School and the Department)	Post-Doctoral Research Fellow
Main activities/responsibilities	Definition of the Laser Doppler (or Laser Interferometry Tracking) mission, now NGGM
Dates (from .. to..)	April 2004 – June 2005
Name and address of the Employer (Public or/and private institution/body)	<i>Thales-Alenia Space S.p.A.</i> 253, Strada Antica di Collegno, 10146, Turin, Italy
Position held (for positions in Universities, the candidate should indicate the Faculty/College/School and the Department)	Engineering consultant for metrology and AOCS
<ul style="list-style-type: none"> ▪ Main activities/responsibilities 	<ul style="list-style-type: none"> ▪ Prediction and digital control of scientific space missions and their relative instrumentation ▪ Tests on NanoBalance ▪ Extensive use of the GOCE E2E simulator ▪ Update of the requirements induced by the Italian Spring Accelerometer on the platform MPO of BepiColombo ▪ Realization of a multi-body dynamics tool for assessing the BepiColombo antenna performance ▪ <i>Simulation and control of the metrology of GAIA</i>

Education and Training (please use the following table to describe Degrees awarded, by only indicating the information concerning Bachelor's Degree, Master of Science's Degree or/and PhD)

Date	January 2001 – December 2003 (Final exam on February 2004)
Institution which issued the degree	Politecnico di Torino - Aeronautical and Space Department (DIASP) 24, C.so Duca degli Abruzzi, 10129, Turin, Italy
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	Ph.D. in Aerospace Engineering
Date	October 1993 - December 2000
Institution which issued the degree	Politecnico di Torino - Aeronautical and Space Department (DIASP) 24, C.so Duca degli Abruzzi, 10129, Turin, Italy
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	Master of Science's Degree (Laurea) in Aerospace Engineering
Date	
Institution which issued the degree	
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	Laurea al Conservatorio (chitarra classica)

EVALUATION FIELDS

- **Scientific Activity**

The three most important outcomes/results of the research activity of the candidate accompanied by the tangible and verifiable evidence that the presented results:

- are original, significant and due to the determining, prevailing and clearly recognizable contribution of the candidate;
- have been widely spread and have obtained outstanding recognitions by the international scientific community;
- qualify the candidate as a distinguished international expert in his/her own field.

First

- **Aerospace America “2013 In Review”**, December 2013

Citation of the ESA's study *Modern attitude control of Earth Observation satellites with large flexible elements* as one of the achievements in 2013 by the AIAA Guidance, Navigation and Control Technical Committee.

Details on the concept conceived in Earth Observation applications, for the first time, can be found in the following publication:

- Massotti L., Arcioni M., Silvestrin P., Ankersen F., Casasco M., “**Modern Attitude Control and Co-design for the Biomass Satellite (Earth Explorer Core Mission 7)**”, In: Preprints of

the 19th IFAC Symposium on Automatic Control in Aerospace, ACA 2013, Würzburg, Germany, 2-6 September 2013, pp. 6, 2013.

Second

Development of the design, including tests preparation and evaluation, of the critical technologies for the provisional call Next Generation Gravity Mission (NGGM). In particular, the activities concerning the propulsion are addressed in the second publication (book chapter).

- Massotti L., Di Cara D., Gonzalez del Amo J., Haagmans R., Jost M., Siemes C., Silvestrin P., **"The ESA Earth Observation Programmes Activities for the Preparation of the Next Generation Gravity Mission"**, *AIAA Guidance, Navigation, and Control Conference 2013*, Boston, Massachusetts, 19-22 August 2013, DOI: [10.2514/6.2013-4637](https://doi.org/10.2514/6.2013-4637)
- Di Cara D., Massotti L., Castorina G., Cesare S., Musso F., Feili D., **"Propulsion Technologies in the Frame of ESA's Next Generation Gravity Mission"**, *Propulsion: Types, Technology and Applications*, Nova Publishers Series, 2011, ISBN: 978-1-61470-606-9

Third

Member of the NASA/ESA Interagency Gravity Science Working Group, as a coordinator. The aim was to establish a strategy with a roadmap for implementing a sustained observing system for Earth's mass transport, in order to understand global and climate changes, giving continuity to the flying mission (like GRACE) with future missions (like GRACE II and NGGM). Details can be found in the next ESA hyperlink. This document has been submitted to the NASA Decadal Survey, in progress (due date: end of 2017).

<http://esamultimedia.esa.int/docs/EarthObservation/IGSWG-Report-May2016.pdf>

- **Coordination of research and technology transfer groups and projects.**
 - Coordination and management of research groups, possibly with international relationships and collaborations; explicit mention of the number and of the type of PhD and Post-Doc students, of whom the candidate has been the academic supervisor;
 - Scientific responsibility (Principal Investigator) of competitive National and International research projects, awarded through a peer-review process.
 - Scientific responsibility of National and International research projects, ruled through partnership agreements with companies and/or public private bodies, which are leaders in their own sector.
 - Outcomes obtained in the field of technology transfer, in terms of participation in start-ups and spin-offs, development, use and commercialization of patents/licenses.
 - Supervisor of stagiers in the Master Degree program.
 - Supervisor, from ESA side, of one Ph.D./NPI student.
 - Member of several Tender Evaluation Boards for issuing ITT at European level, in several fields: from subsystem design and testing (e.g. AOCS equipment), payload (optical and microwave) up to space mission design and implementation into project phases
 - Deputy Technical Officer in several International R&D and Phase A projects, notably:
 - Consolidation of the system concept for the NGGM (2016/2017)

- Simulation framework for the Image Navigation and Registration (INR) processing for a high resolution mission from GEO orbit (GEO-HR) (2015/2017).

- **National and international reputation and professional activity for the scientific community**

- Editorship of Journals with international reputation (in the role of Editor in Chief – EIC), editorship of book series, encyclopedias and essays of recognized prestige.
- Participation in the Editorial Board of Journals with international reputation (in the role of Associate Editor or equivalent), participation in the Editorial Board of book series, encyclopedias and essays of recognized prestige.
- Direction of highly qualified international institutions or research centres.
- Official research and/or teaching and/or fellowship roles, positions as Scholar/ Visiting Professor in international highly qualified universities and research centres.
- Offices in the Governing bodies of national and international scientific societies.
- Participation in Academies with international reputation in the research field of the candidate.
 - Prizes and awards awarded to the candidate for his/her scientific activity and project activity in the Academic Fields, where this is appropriate.
- Participation in international conferences, as a distinguished invited speaker; participation in the scientific committees of International Conferences.
 - Management and organisation of exhibitions, compositions, drawings, design, hand-crafted items, prototypes, artwork and their projects, databases and software, thematic maps, for the Academic Fields, where this is appropriate.

- Editorial Board member:

- Recent Patents on Space Technology (on-line Journal, Benthamscience Publishers)
- Scientific World Journal - Aerospace Engineering (Hindawi Publ. Corporation)

- Organizer and reviewers in several conferences:

- *AIAA Guidance Navigation & Control Conference (GNC), 2007*
- *IEEE Conf. on Emerging Technologies and Factory Automation, ETFA 08*
- *2008 AIAA Guidance, Navigation, Control conference and Exhibit*
- *2009 AIAA Guidance, Navigation, Control conference and Exhibit*
- *2013 AIAA Guidance, Navigation, Control conference (as Invited session organizer)*
- *AIAA Science and Technology Forum and Exposition - SciTech 2015, Kissimmee, FL, 5-9 January 2014*
- *IEEE Transactions on Industrial Informatics*
- *AIAA Science and Technology Forum and Exposition - SciTech 2016*

- AIAA GNC **Technical Committee member** since May 1st, 2014

- **Visiting Researcher** as Control System architect at West Virginia University – Mechanical & Aerospace Engineering Department – on a project (see link below) paid by NASA Dryden, in 2001 and 2002.

Gen 1/Gen 2 phases of the NASA IFCS F-15 Fault Tolerant Systems
<http://www.nasa.gov/centers/dryden/news/FactSheets/FS-048-DFRC.html#.UrAlxY1ZUco>

WVU

PO Box 6201, Morgantown, West Virginia 26506, USA

- **Lecturer** at Giessen University (D) (July 2012), *Politecnico di Torino* (I) (March 2013), Fachhochschule Wiener Neustadt (FOTEC, A) (Nov. 2013).

- **Invited speaker** at CNES (Paris, September 2016) in the frame of the workshop “ Atom Interferometry & Space Geodesy”

- Guest Researcher:

- Huazhong University of Science and Technology (HUST) (2015)
Center of Gravitational Experiment (CGE) – Wuhan (China)

- TIANQIN Research Center for Gravitational Physics (2016)
School of Physics and Astronomy
Sun Yat-sen University (SYSU), Zhuhai Campus, Zhuhai, China 519082

If the candidate has obtained the National Scientific Qualification in more than one Academic Field this must be considered a qualifying element, for properly evaluating the scientific reputation of the candidate.

▪ **Teaching activity**

Formal responsibility of Bachelor's and Master of Science's degree courses in Italian and/or foreign universities.

Formal responsibility of PhD courses in Italian and/or foreign universities.

Formal responsibility of Specializing Master's courses and Life Learning courses in Italian and/or foreign universities in PhD courses.

▪ **Institutional offices and roles in Italian and foreign Universities and/or public and private institutions with scientific and/or technology transfer aims**

- Institutional offices and roles in the Governing bodies (Academic Senate, Board of Governors) of Italian and/or foreign universities.
- Institutional offices and roles in teaching and research structures (Departments, Faculties, Schools, Colleges) and other service activities developed in Italian and Foreign Universities.
- Management roles in Universities, as part of Faculty duties.
- Offices in the Governing bodies, Board of Governors, Scientific Advisory Boards of public and private institutions, with scientific and technology transfer aims.

Permanently working at the ESTEC premises of the European Space Agencies in The Netherlands.

www.esa.int