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CURRICULUM VITAE

Family name: **Bassan**

First names: **Michele**

Date of birth: **29/07/1959**

Nationality: **Italian**

Civil status: **Married**

Education: **University Degree in Physics (Nov 1983), Specialization school in Nuclear Fusion Engineering (1984-1985)**

Institution (Date from - Date to)	Degree(s) or Diploma(s) obtained:
University of Padova, 1978-1983	Degree in Physics 110/110 with honours
University of Padova, 1984-1985	Specialization course in "Engineering of Plasma and Controlled Nuclear Fusion"
UKAEA, July 1986	Summer school on Plasma Physics in Culham
Varenna International School, Sept 1986	Course and Workshop on Basic and Advanced Fusion Plasma Diagnostic Techniques

Language skills: Indicate competence on a scale of 1 to 5 (1 - excellent; 5 - basic)

Language	Reading	Speaking	Writing
Italiano	1	1	1
English	1	2	2
Francais	1	2	2
Espanol	3	5	5
Russian	3	4	4
Romanian	3	5	5

Membership of professional bodies: ANFEA - Associazione Nazionale Fisica e Applicazioni

Other skills: (e.g. Computer literacy, etc.) Computer programming since 1978, Assembler, Basic, Pascal, Fortran, Ratfor, MACRO for VAX, LabView, IDL, C, C++, PHP, system level working knowledge of Windows OS and Linux.

Present position: Senior Engineer at ITRE. Srl, External contractor for ITER

Years within the firm: 5

Key qualifications: operation and/or design of 4 different Thomson scattering systems (EtaBetaII, RFX, FT, FTU); team leader in various institutes and companies in the last 30 years

Specific international experience:

Country	Date from - Date to
UKAEA – UK Culham	August 1988
France – ITER	June 2012 - current
USA & Canada	Short trips (2/3 weeks each time), several times every year since late 199x

Professional experience (Relevant to the project)

Date from – Date to	Location	Company & reference person	Position	Description
Jan 84-Jun 85	Padova	Istituto Gas Ionizzati – prof. Leonardo Giudicotti	"post-doc" student	
24/06/85 - 30/04/87	Frascati (RM)	ENEA Dipartimento Fusione – dr. Rosario Bartiromo	Research physicist	See below
01/05/87-May 1997	Padova	Istituto Gas Ionizzati/RFX – prof. Leonardo Giudicotti	Research physicist	
1997-2000	Vigonza (PD)	i3 srl, Internet services company	CTO	
1998-2002	Padova	Inforeti snc, Internet services and applications developer	CTO	
2002-2012	Campodarsego (PD)	S.P.In. srl, system integrator, automation sw and hw developments, automation equipment manufacturing	CFO, CTO, majority owner	
2012-2015	Campodarsego (PD)	S.P.In. srl, in addition external consultant for development of Thomson scattering diagnostics at ITER	CFO, CTO, majority owner	
2015-present	Campodarsego (PD)	ITRE. srl, as above	CTO	

Other relevant information (e.g., Publications)

Description of the studies and work career

High school for classic education "A. Canova" in Treviso, Italy completed in 1978 (50/60).

Graduated in physics in November 1983 with maximum votes and honours at the University of Padova, Italy with an experimental thesis on Thomson scattering applied to nuclear fusion plasma. The thesis was also awarded a prize by the "Istituto Veneto di Scienze Lettere ed Arti". The 18 months long thesis involved assembling and calibrating a new dual channel spectrometer for Thomson scattering on the EtaBeta RFP machine, as well as the initial operation of the complete diagnostic system after reconditioning of a 10 J single pulse ruby laser.

From Jan 1984 to June 1985 attended the Specialization course in "Engineering of Plasma and Controlled Nuclear Fusion" of the University of Padova, continuing the development of the Thomson Scattering diagnostic writing the data acquisition and data analysis and simulation programs under the supervision of prof. Leonardo Giudicotti of the University of Padova. The final thesis of the course was an original theoretical work on the propagation of multi-mode high power laser beams with rectangular profile (as produced by slab lasers). Simultaneously also worked for 13 months at the Sanitary Physics department of the public hospital of Padova to perform the duties of the mandatory civilian service, developing from scratch a computerized system for automation of environmental data collection and for automatic quantitative and qualitative detection of radioactive isotopes in environmental waste samples, a job that involved low-level hw & sw interfacing of a multichannel device with a PDP minicomputer and coding a set of spectrum-fitting and data-management programs. The system was the only one in the region available to the public health system for assessing in quasi real-time the evolution of the radioactive pollution one year later during the Chernobyl disaster..

Winner in December 1983 of a research physicist position at ENEA research institution, Nuclear Fusion department of Frascati, Rome, joined ENEA from June 1985 to April 1987.

While with ENEA, I rebuilt the non-operational multipoint Thomson scattering system available on the FT tokamak site (based on a ruby laser), recalibrating the system and rewriting completely the data acquisition, calibration and analysis software tools. Then I designed in collaboration with the external supplier CISE of Segrate (MI, Italy) the new multipoint/multipulse Nd-YLF laser based system for later installation on FTU.

Winner in December 1986 of a research physicist position at CNR research institute "Istituto Gas Ionizzati" (part of the RFX team), I joined CNR on 1st May 1987. I worked initially on expansion of the Thomson scattering diagnostic for the EtaBeta II machine, and then on design, construction, testing and operation of the multipoint-multipulse TS diagnostic for the RFX device. A short parenthesis involved a 1 month activity at the HBTX1A RFP device installed in Culham, for reactivation and operation of the dye-laser based neutral particles diagnostic, in August 1988.
The position involved hands-on developments, specifically for the testing of the individual components and for the final commissioning on the machine, and supervision of the development and construction of the components at the suppliers locations [detectors (ITT, USA), mechanical parts (DePretto, Italy), custom optics (Italy), fiber optics (USA), custom electronics (AUREL, Italy), ruby laser (UK)]. I personally developed the largest part of the software needed for data acquisition, system calibration and plasma data analysis.
As part of my duties in the institute, I was also responsible of the selection of hw and sw for the network of Apple Macintosh computers used by the RFX team of physicists and engineers (about 50 personal computers), and was coordinator and advisor for the selection of the data acquisition equipment for all physics diagnostic systems.
The activity at RFX led to the production of several scientific and technical papers, and to the participation to several international conferences and to specific committees like the “Technical Committee Meeting on LIDAR Thomson scattering”, JET Laboratories, Culham (GB) in April 1992.

In 1997 I left CNR to establish a professional career, initially partner in i3 srl (Vigonza, PD, Italy) for consultancy on Internet related technical and commercial issues.

In 1998 I founded Inforeti snc (Padova) with two partner engineers for the production of Internet and intranet software (e-commerce, remote learning), working as software designer and sales manager.

In 2002 I left Inforeti becoming majority owner and CEO of S.P.In. srl, dedicated to the development of software and hardware in the field of intelligent video and data acquisition systems for security, surveillance and data gathering (civil protection, highway authorities, public institutions), for fixed and mobile installations, as well as to systems integration in general.
From 1998 to 2006 I worked as external consultant for Gamma srl, Vicenza, Italy, a leading manufacturer of automatic machines for rental of multimedia, where I was in charge of the software architecture developments and of new products design and development (e.g. a fully automated e-commerce solution deployed within the Venice airport saloons), with direct contacts with the company international customers for assessing their technical requirements and designing the solutions.
From 2003 to 2005 I created and run a company in Craiova, Romania (CIR srl), for the production of industrial wirings, mainly sold to the major Italian producer of washing machines Sole spa, part of the Electrolux group.
Since 2007, when Gamma closed down its operations, S.P.In. has directly produced the line of machines previously manufactured by Gamma, customizing them for use in public libraries. S.P.In. has extended the line of products for library automation to automatic machines for books delivery, self-checks, automated 24h book-drops, including RFID detection.

In 2010 I developed a security product for solar panels installations based on loops of plastic fiber optics and smart nodes, submitting the patent application.

In June 2012 I was indirectly hired as consultant by ITER (www.iter.org) as technical officer to support the design of both diagnostic Thomson scattering systems for the measurement of the electron density and temperature profiles of the edge plasma and of the core plasma.

In September 2015 I was hired by a new company ITRE srl, still continuing my work as consultant for ITER in the same projects. As of Jan 2020, the project for the edge system has advanced through the first two key phases (conceptual and preliminary design) and had entered the final design phase. The more demanding core system project has completing the revision of the conceptual phase in the fall of 2019, and the PA has been signed with F4E at the end of December 2019.

The activities that I brought forward so far in ITER projects have been:

1. Organisation of design reviews, organisation of monthly meetings with stakeholders, setting up of agendas, following up of actions, control of completeness of documentation
2. Interfacing with partners at ITRE Domestic Agencies and suppliers across the world to ensure the coherent development of diagnostic systems,
3. Support of management of diagnostic integration activities in to the ITER infrastructure,
4. Support of identification of effective risk for diagnostic systems, including preparation of RAMI and HIRA reports
5. Support of evaluation and advancement of various diagnostic reports, also for other systems
6. Support of evaluation of diagnostic reports for accuracy and provision of expert advice on these reports, also for other systems
7. Support of development of the interface specification and negotiation to completion with opposite side for specified diagnostic and integrated diagnostic systems,
8. Support of management of the structural integrity analysis / load definitions of diagnostic systems and their interfaces,
9. Support of evaluation of design compliance with ITER requirements and with requirements for diagnostic systems and proposals for their improvements
10. Support of documentation of Plasma diagnostic systems, including preparation of cabling diagrams
11. Support of management of other tasks as relevant to progress development of diagnostic systems.

List of publications

M. Bassan, A.Buffa, L. Giudicotti, "Un apparato per misure di scattering Thomson multipunti in ETA-BETA II", IV Congresso Nazionale di Elettronica Quantistica e Plasmi, Capri, Maggio 1984

V. Antoni et al., "Reversed Field Pinch Plasmas with Current Flat-Top in ETA-BETA II", Proc. 10th International Conference on Plasma Physics and Controlled Nuclear Fusion Research, IAEA, London, 12-19 September 1984, vol. II, p. 487

M. Bassan, A.Buffa, L. Giudicotti, "Apparatus for multipoint Thomson scattering measurements in the ETA-BETA II Reversed Field Pinch experiment", Rev. Sci. Instrum., 56, 1027, (1985)

A. Alper, V. Antoni, M. Bassan et al., "RFP confinement studies in ETA-BETA II", 12th European Conference on Controlled Fusion and Plasma Physics, Budapest, 1985

D. Santi, M. Bassan, A. Brusadin, "FT Thomson scattering", Proceedings of the Course and Workshop on Basic and Advanced Fusion Plasma Diagnostic Techniques, Varenna, September 3-13, 1986

F. Alladio,.et al., "Preliminary results in lower hybrid heating in FT at 8 GHz", 7th Topical Conference on Applications of Radiofrequency Power to Plasmas, Kissimmee, May 4-6,1987

F. Alladio,.et al., "Transmission and coupling at high power density of 8 GHz lower hybrid on FT", 7th Topical Conference on Applications of Radiofrequency Power to Plasmas, Kissimmee, May 4-6,1987

F. Alladio, G. Bardotti, R. Bartiromo, M. Bassan et al., "Sawtooth heat pulse diffusion in the Frascati Tokamak", 14th European Conference on Controlled Fusion and Plasma Physics, Madrid, June 22-26,1987

F. Alladio, G. Bardotti, R. Bartiromo, M. Bassan et al., "Sawtooth period and the possible evidence of a magnetic trigger for the sawtooth crash in the ohmic discharges of FT", 14th European Conference on Controlled Fusion and Plasma Physics, Madrid, June 22-26, 1987

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M. Bassan, F. Flora, L. Giudicotti, "Automatic Laser beam alignment for a Thomson scattering system", Rev. Sci. Instrum., 59, 1482, (1988)
V. Antoni et al., "Recent results of the ETA-BETA II experiments", Proceedings of 15th European Conf. on Plasma Physics and Contr. Nucl. Fusion, Dubrovnik, 16-20 May 1988
V. Antoni et al., "Experimental and theoretical studies on RFP plasma confinement", Proceedings of 12th International Conf. on Plasma Physics and Contr. Nucl. Fusion, Nice, 12-20 October 1988
V. Antoni, M. Bassan et al., "Processi di rilassamento di plasma ad alto Q", Atti del V Congr. Naz. di Elettronica Quantistica e Plasmi, Firenze, 16-19 Novembre 1988, pag. 503
M. Bassan, F. Flora, L. Giudicotti, R. Pasqualotto, "Calibrazione di un apparato di scattering Thomson mediante scattering Raman rotazionale in Idrogeno e Deuterio", Atti del V Congr. Naz. di Elettronica Quantistica e Plasmi, Firenze, 16-19 Novembre 1988, 29, 605
L. Giudicotti, M. Bassan, A. Sardella, E. Perdon, "Short recovery time, multianode, microchannel plate photomultiplier for plasma diagnostics", proceedings of 33rd SPIE International Annual Symposium on Optical and Optoelectronic Applied Science and Engineering, San Diego, California, 6-11 August 1989, SPIE Volume 1158, UV Technology III, 173 (1989)
M. Bassan, L. Giudicotti, R. Pasqualotto, A. Sardella, "Development of a Multipoint Thomson Scattering System for a Large Reversed Field Pinch Experiment", Proceedings of 8th Topical Conf. on High Temperature Plasma Diagnostics, Hyannis, MA, 6-10 May 1990, Rev. Sci. Instrum., 61, 2846, (1990)
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M. Bassan, L. Giudicotti, R. Pasqualotto, A. Sardella, "Electronics for microchannel plate detectors of a Thomson Scattering System", Proceedings of 9th Topical Conf. on High Temperature Plasma Diagnostics, Santa Fe, NM, 15-19 March 1992, Rev. Sci. Instrum., 63, 4944, (1992)
P. Pizzolati et al., "The Frascati Tokamak Upgrade Thomson scattering system: the optical and spectral analysis equipments", Proceedings of 9th Topical Conf. on High Temperature Plasma Diagnostics, Santa Fe, NM, 15-19 March 1992, Rev. Sci. Instrum., 63, 4403, (1992)
The RFX Team “First results on the RFX reversed field pinch experiment”, 14th Intern. Conf. on Plasma Physics and Contr. Nucl. Fusion, Wurzburg, Sept. 30-Oct 7 1992
M. Bassan, L. Giudicotti, R. Pasqualotto, "Non-linear optical effects in Raman calibrations of a Thomson scattering system", Applied Optics, 32, 5313, (1993).
M. Bassan, L. Giudicotti, R. Pasqualotto, A. Sardella, "Numerical and analytical models of gain saturation in microchannel plate devices", Proceedings of the conference on EUV, X-Ray and Gamma-Ray Instrumentation for Astronomy IV San Diego July 93, SPIE Vol. 2006, p. 170, Society of Photo Optical Instrumentation Engineers, Bellingham, WA, USA (1993
The RFX Team “Confinement studies on RFX”, 20th EPS Conf. on Contr. Nucl. Fusion and Plasma Physics, Lisboa, Portugal, July. 26-30 1993
M. Bassan. , L. Giudicotti, L. Lotto, R. Pasqualotto, A. Romagnolo, A. Sardella "Riduzione del rumore di fondo in una diagnostica di scattering Thomson mediante trattamento non lineare del segnale", presentato al LXXIX Congresso Nazionale della Società Italiana di Fisica, Udine, 27 settembre - 2 ottobre 1993
M. Bassan, L. Giudicotti, L. Lotto, R. Pasqualotto, A. Romagnolo, A. Sardella "Signal-to-noise ratio enhancement by real time correlation techniques for a Thomson scattering system", Proceedings of the 6th International Symposium on Laser-Aided Plasma Diagnostics, Bar Harbor, Maine, USA 25-28 October 1993
M. Bassan, L. Giudicotti, R. Pasqualotto, A. Sardella, "Simple analytical model of gain saturation in microchannel plate devices", Rev. Sci. Instrum., 65, 247 (1994)

INTERNAL TECHNICAL NOTES while working at the Istituto Gas Ionizzati del CNR
M. Bassan, L. Giudicotti, "Data analysis and optimization of spectral configurations in Thomson scattering measurements by the two channel method", C.N.R. Internal Report I.G.I. 84/03
M. Bassan DD/25 14/11/88 "Specifiche per un sistema di amplificazione ed acquisizione di segnali elettrici veloci per la diagnostica di Thomson scattering"
M. Bassan, G. Flor DD/28 8/2/89 and DD/28bis 4/5/93 "Specifications for serial links integrated in the data acquisition system of RFX"

M. Bassan DD/31 9/6/89 "Approvvigionamento e tests hardware di acquisizione dati"
M. Bassan, P. Innocente FI/19 22/12/89 "Programmi di elaborazione dati per RFX"
M. Bassan, G. Flor, M. Moresco DD/39 29/1/90 "Reflectometer Data Acquisition, problems with the Farran Proposal"
M. Bassan, P. Innocente DD/40 31/1/90 "Reflectometer Data Acquisition, tests of GPIB throughput rate"
M. Bassan, M. Giubbilei, P. Innocente FI/20 2/7/90 "Summary File Data Base"
M. Bassan, P. Innocente FI/21 30/7/90 "Software for the Archival, Research and Analysis of Data (SARA)"
M. Bassan, P. Sonato, V. Toigo DD/46/N 3/8/90 e DD/46bis/N 3/10/90 "Specifiche per i collegamenti tra i sistemi da vuoto delle diagnostiche e il sotto-sistema Vessel"
M. Bassan CT/195 17/4/91 "I/O digitale per il sistema di condizionamento delle misure eletromagnetiche di RFX"
M. Bassan, A. Romagnolo DD/64 28/7/93 "An interface converter and driver software for the control of RS232 devices with a Macintosh personal computer using LabView"
M. Bassan, L. Giudicotti, L. Lotto, R. Pasqualotto, A. Romagnolo, A. Sardella, "Background noise reduction in a Thomson scattering diagnostic by real-time non-linear signal processing", C.N.R. Internal Report I.G.I. 93/01
M. Bassan, CT-242 29/11/93 "Procedure automatizzate di calibrazione per le schede CAMAC di timing per Thomson scattering della ditta AUREL"

MORE RECENT PAPERS while working at ITER
E. Yatsuka, T. Hatae, G. Vayakis, M. Bassan, K. Itami **Chevron beam dump for ITER edge Thomson scattering system** Rev. Sci. Instrum., 84 (2013), p. 103503 **http://dx.doi.org/10.1063/1.4824141**

E. Yatsuka, M. Bassan, T. Hatae, M. Ishikawa, T. Shimada, G. Vayakis, M. Walsh, R. Scannell, R. Huxford, P. Bilkova, P. Bohm, M. Aftanas, K. Itami **Progresses in development of the ITER edge Thomson scattering system** J. Instrum., 8 (2013), p. C12001 http://dx.doi.org/10.1088/1748-0221/8/12/C12001

G.S. Kurskiev, P.A. Sdvizhenskii, A.B. Kukushkin, E.E. Mukhin, M. Bassan, **Opportunities for Accuracy Enhancement of Core Plasma Thomson Scattering Diagnostics in Tokamak Reactors**, 41st EPS 2014, Berlin, Proc. 41st EPS Conf. on Plasma Physics (Berlin, Germany, 23-27 June2014) P5.009, http://ocs.ciemat.es/EPS2014PAP/pdf/P5.009.pdf

P.A. Sdvizhenskii, A.B. Kukushkin, G.S. Kurskiev, E.E. Mukhin, M. Bassan, **Method of evaluating the accuracy of the non-maxwellian plasmas by Thomson scattering diagnostics in TOKAMAK reactors**, Problems of Atomic Science and Technology (Series in Thermonuclear Fusion vol 37) pp 38-47 (in Russian), http://vant.iterru.ru/vant_2014_3/4.pdf

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M. Bassan, P. Andrew, G. Kurskiev, E. Mukhin, T. Hatae, G. Vayakis, E. Yatsuka and M. Walsh, **Thomson scattering diagnostic systems in ITER**, 17th LAPD 2015, 2016 JINST 11 C01052, doi:10.1088/1748-0221/11/01/C01052

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E. Yatsuka, M. Bassan, Takaki Hatae[a], Ichihiro Yamada[c], Ryo Yasuhara[c], Hisamichi Funaba[c], Tsuyoshi Yamamoto[d], Takahiko Shimada[e], Kazuhiro Torimoto[f] and Kiyoshi Itami[a]. **Technical Innovations for ITER Edge Thomson Scattering Measurement System** 2017, ISFNT 1, Fusion Eng. And Design, Vol 136, part B, nov 2018, 1068-1072, https://doi.org/10.1016/j.fusengdes.2018.04.071

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