

Dra. Vito S. GALLIGANI

Investigadora Asistente CONICET

Centro de Investigaciones del Mar y la
Atmósfera (CONICET-UBA)
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Interests

Radar and satellite remote sensing
Radiative transfer
High impact weather
Clouds, precipitation and microphysics
Cloud scattering properties

EDUCATION

-  MSci. Physics, Imperial College London (Reino Unido), 2010
-  PhD, *Microwave and millimeter radiometry for the characterization and quantification of ice and snow clouds*, École Doctorale d'Astronomie et d'Astrophysique d'Ile de France, Paris (France), 2014. Supervisor: Catherine Prigent.

RESEARCH EXPERIENCE

Relevant publications

1. Corrales P, **Galligani V.**, Ruiz J., Sapucci L., Dillon M.E., Garcia Skabar Y., Sacco M., Schwartz C., and Nesbitt Stephen, 2022: Hourly Assimilation of Different Sources of Observations Including Satellite Radiances in a Mesoscale Convective System Case During RELAMPAGO campaign, *Atmospheric Research*, vol. **281**, 106456, doi: <https://doi.org/10.1016/j.atmosres.2022.106456>.
2. Velazquez Y. R., Nicora M.G., **Galligani V. S.**, Wolfram E.A., Orte, D'Elia R., Papandreas S. and Verstraeten F., 2022: The 2020 Patagonian Solar Eclipse from the point of view of the Atmospheric Electric Field, *Papers in physics*, 14, 140008. <https://doi.org/10.4279/pip.140008>.
3. Bechis, H., **Galligani V. S.**, Alvarez Imaz M., Cancelada M., Simone I., Piscitelli F., Maldonado P., Salio P. and Stephen W. Nesbitt, 2022: A case study of a severe hailstorm in Mendoza, Argentina, during the RELAMPAGO-CACTI field campaign, *Atmospheric Research*, vol. **271**, 106127, doi: <https://doi.org/10.1016/j.atmosres.2022.106127>.
4. Barlakas,V., **Galligani, V. S.**, A. Geer and P. Eriksson, 2022: Radiative transfer model inter-comparison for passive microwave all-sky conditions, *Journal of Quantitative Spectroscopy and Radiative Transfer*, vol. **283**, 108137, doi: <https://doi.org/10.1016/j.jqsrt.2022.108137>.
5. Casanovas, C.; Salio, P.; **Galligani, V. S.**; Dolan, B. and Nesbitt, S.W, 2021: Drop Size Distribution Variability in Central Argentina during RELAMPAGO-CACTI. *Remote Sens.* 2021, 13, 2026, doi: <https://doi.org/10.3390/rs13112026>.
6. Cutraro, F., **Galligani V. S.** and Y. Garcia Skabar, 2021: Evaluation of synthetic satellite images computed from radiative transfer and convection-allowing numerical weather prediction models over a region of South America, *Q. J. R. Meteorol. Soc.*, vol. **147**(738), 2988–3003, doi: <https://doi.org/10.1002/qj.4111>.
7. **Galligani, V. S.**, D. Wang, P. B. Corrales and C. Prigent, 2021: A Parameterization of the Cloud Scattering Polarization Signal Derived From GPM Observations for Microwave Fast Radiative Transfer Models, *IEEE Transactions on Geoscience and Remote Sensing*, vol. **59**(11), 8968 - 8977, doi: [10.1109/TGRS.2021.3049921](https://doi.org/10.1109/TGRS.2021.3049921).
8. **Galligani, V. S.**, 2018: Comparison of the simulated microwave cloudy radiances using ARTS and RTTOV-SCAT, International TOVS Study Conference-XXI Proceedings.
9. **Galligani, V. S.**, Wang, D., Alvarez Imaz, M., Salio, P., and Prigent, C, 2017: Analysis and evaluation of WRF microphysical schemes for deep moist convection over south-eastern

- South America (SESA) using microwave satellite observations and radiative transfer simulations, *Atmos. Meas. Tech.*, 10, 3627–3649, <https://doi.org/10.5194/amt-10-3627-2017>.
10. **Galligani, V. S.**, Prigent, C., Defer, E., Jimenez, C., Eriksson, P., Pinty, J.-P., and Chaboureaud, J.-P., 2015: Meso-scale modelling and radiative transfer simulations of a snowfall event over France at microwaves for passive and active modes and evaluation with satellite observations, *Atmos. Meas. Tech.*, 8, 1605-1616, doi: <https://doi.org/10.5194/amt-8-1605-2015>.
 11. Defer, E., **V. S. Galligani**, C. Prigent, and C. Jimenez, 2014, First observations of polarized scattering over ice clouds at close-to-millimeter wavelengths (157 GHz) with MADRAS on board the Megha-Tropiques mission, *J. Geophys. Res. Atmos.*, 119(12), 301–12,316, doi: <https://doi.org/10.1002/2014JD022353>.
 12. **Galligani V. S.**, C. Prigent, E. Defer, C. Jiménez, and P. Eriksson, 2013: The impact of the melting layer on the passive microwave cloud scattering signal observed from satellites: A study using TRMM microwave passive and active measurements, *Journal of Geophysical Research*, Vol. 118(11), 1-12, doi:[10.1002/jgrd.50431](https://doi.org/10.1002/jgrd.50431).

Attendance at conferences and seminars

1. Corrales P., Schwartz, C., Ruiz, J. and **Galligani, V.** Assimilation of polar and geostationary satellite observations during RELAMPAGO using a WRF-GSI-LETKF system. 8th International Symposium on Data Assimilation (ISDA). Colorado, USA. June 2022. Abstract and Presentation.
2. Velazquez, Y., Nicora M.G., and **Galligani V.** Curva Local media diaria de la variable Gradiente de Potencial y su relación con las tormentas a gran escala. XXIX REUNIÓN CIENTÍFICA ASOCIACIÓN ARGENTINA DE GEOFÍSICOS Y GEODESTAS. Mendoza, Argentina. 2021. Abstract and poster.
3. Bechis, H., **Galligani V.S.**, Alvarez Imaz M., Cancelada M., Simone I., Piscitelli F., Maldonado P., Salio P. and Stephen W. Nesbitt. Analysis of the environment of a severe hailstorm in Mendoza, Argentina during the RELAMPAGO-CACTI field campaign. EMS Annual Meeting (online). September, 2021. Abstract and poster.
4. Corrales P., J. Ruiz, V.S. **Galligani**. Forecast Evaluation of a Deep Convection Case During Relampago Assimilating Conventional and Satellite Observations with the WRF-GSI-LETKF System. WCRP-WWRP Symposium on Data Assimilation and Reanalysis (online). September, 2021. Abstract and poster.
5. Barlas, V., **Galligani, V.S.**, A. Geer and P. Eriksson. On the accuracy of RTTOV-SCATT for radiative transfer in all-sky conditions. International TOVS Study Conferences (ITSC) XXIII (online). June, 2021. Abstract and poster.
6. Corrales P., J. Ruiz, V.S. **Galligani**. Forecast Evaluation of a Deep Convection Case During Relampago Assimilating Conventional and Satellite Observations with the WRF-GSI-LETKF System. International TOVS Study Conferences (ITSC) XXIII (online). June, 2021. Abstract and poster.
7. Corrales P, **Galligani V.S.**, Ruiz J., Sapucci L., Dillon M.E., Garcia Skabar Y., Sacco M., and Nesbitt Stephen. Assimilation of conventional and satellite observations in a deep convection case during RELAMPAGO using the WRF-GSI-LETKF system. The International EnKF Workshop 2021 (online). June, 2021. Abstract and poster.
8. Bechis, H., **Galligani V.S.**, Alvarez Imaz M., Cancelada M., Simone I., Piscitelli F., Maldonado P., Salio P. and Stephen W. Nesbitt. A case study of a severe hailstorm in Mendoza, Argentina, during the RELAMPAGO-CACTI field campaign. 3rd European Hail Workshop (online). March, 2021. Abstract and poster.
9. Casanovas C., P. Salio, **V.S. Galligani**, N. Stephen, and B. Dolan. Drop-Size Distribution Variability over Central Argentina during RELAMPAGO-CACTI. American Geophysical Union (AGU) Fall Meeting. December, 2019. San Francisco, USA. Abstract and poster.
10. **Galligani V.S.**, D. Wang, and C. Prigent. Microphysical properties of ice particles as revealed by satellite microwave polarimetric measurements and radiative transfer modeling. American

- Geophysical Union (AGU) Fall Meeting. December, 2019. San Francisco, USA. Abstract and poster.
11. **Galligani V.S.**, D. Wang, C. Prigent and P. Salio. Microphysical properties of ice particles as revealed by satellite microwave polarimetric measurements and radiative transfer modeling. RELAMPAGO-CACTI Data Analysis Workshop. 19-22 November, 2019. Buenos Aires, Argentina. Abstract and poster.
 12. Corrales P., J. Ruiz, V.S. **Galligani**, M. Sacco, M. E. Dillon, Y. Garcia Skabar, L. Sapucci, and S. Nesbitt. Assimilation of conventional observations in a deep convection case during RELAMPAGO using the WRF-GSI-LETFK system. RELAMPAGO-CACTI Data Analysis Workshop. 19-22 November, 2019. Buenos Aires, Argentina. Abstract and poster.
 13. Casanovas C., P. Salio, and **V.S. Galligani**. Drop-Size Distribution Variability over Central Argentina during RELAMPAGO-CACTI. RELAMPAGO-CACTI Data Analysis Workshop. 19-22 November, 2019. Buenos Aires, Argentina. Abstract and poster.
 14. **Galligani V.S.**, D. Wang, and C. Prigent. Microphysical properties of ice particles as revealed by satellite microwave polarimetric measurements and radiative transfer modeling. XXII International TOVS Study Conference (ITSC). 31 October - 6 November, 2019. Saint-Sauveur, Québec, Canada. Abstract and poster.
 15. **Galligani V.S.**, D. Wang, and P. Maldonado. Implementation and evaluation of a new forward polarimetric radar operator for the Weather Research and Forecasting model (WRF). Congremet XIII. 16-19 October, 2018. Rosario, Argentina. Abstract and poster.
 16. Cutraro F., **V.S. Galligani**, Y. Garcia Skabar. Generation of IR synthetic satellite observations from numerical prediction models. Congremet XIII. 16-19 October, 2018. Rosario, Argentina. Abstract and poster.
 17. **Galligani V.S.** and P. Eriksson. Comparison of the simulated microwave cloudy radiances using ARTS and RTTOV-SCAT. XXI International TOVS Study Conference (ITSC). 29 November - 5 December, 2017. Darmstadt, Germany. Abstract and poster.
 18. **Galligani V.S.**, D. Wang, M. Alvarez Imaz, P. Salio and C. Prigent. Analysis and evaluation of WRF microphysical schemes for deep moist convection over Southeastern South America (SESA) using microwave satellite observations and radiative transfer simulations. 8th IPWG and 5th IWSSM Joint Workshop. 3-7 October, 2016. Bologna, Italy. Abstract and oral presentation.
 19. **Galligani V.S.**, D. Wang, M. Alvarez Imaz, P. Salio and C. Prigent. Analysis and evaluation of WRF microphysical schemes for deep moist convection over Southeastern South America (SESA) using microwave satellite observations and radiative transfer simulations. CONGREGMET XII. Mar del Plata, Argentina. 26-29 May, 2015. Abstract and poster.
 20. **Galligani V.S.** and C. Prigent. Microwave radiometry for the detection of snowfall. Journées CNES jeunes Chercheurs (CNES). 8-10 October, 2012. Toulouse, France. Abstract and poster.
 21. **Galligani V.S.**, C. Jimenez, E. Defer and C. Prigent. Snowfall characterization over land using active and passive microwave satellite observations. CALIPSO, CloudSat, EarthCARE ESA Joint Workshop. 18 – 22 June, 2012. Paris, France. Abstract and poster. **Galligani V.S.**, C. Jimenez, E. Defer and C. Prigent. Snowfall characterization over land using active and passive microwave satellite observations. XVIII International TOVS Study Conference. 21 – 27 March, 2012. Toulouse, France. Abstract and poster.
 22. **Galligani V.S.**, C. Jimenez, E. Defer and C. Prigent. On the characterization of frozen hydrometeors from passive and active observations. XII Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment (MicroRad). 5 – 9 March, 2012. Frascati, Italy. Abstract and oral presentation.
 23. **Galligani V.S.** and C. Prigent. Journées CNES jeunes Chercheurs (CNES). 10-12 October, 2011. Toulouse, France.

Other Activities

1. Co-chair of the Radiative transfer and surface property modeling working group of the International TOVS Study Conferences (ITSC)

Scholarships and Awards

2. **Best poster award.** “Microphysical properties of ice particles as revealed by satellite microwave polarimetric measurements and radiative transfer modeling”. XXII International TOVS Study Conference (ITSC). 31 October - 6 November, 2019. Québec, Canada.
3. **Houssay Research Stay:** CONICET/CNRS. 2016. Lugar de trabajo: LERMA, L’Observatoire de Paris, Francia. Lapso: 3 meses. Director: Dr. Prigent y Dra. Salio. Tema trabajo: Analysis and validation of cloud and precipitation microphysics properties of deep moist convection over South Eastern South America, using observations and modeling tools.
4. **Postdoctoral position (CONICET):** Estudio y validación de la microfísica característica de las nubes y precipitación utilizados en pronósticos WRF de casos severos de convección húmeda profunda observados durante la campaña CHUVA-Santa Maria. 1st. August 2014 through 31st. January 2016.

Journals serving as a reviewer for submitted papers

- Atmospheric Measurement Techniques, EGU.
- Journal of Atmospheric and Solar Terrestrial Physics.
- Journal of Geophysical Research: Atmospheres.
- Quarterly Journal of the Royal Meteorological Society.
- Journal of Applied Meteorology and Climatology.
- IEEE Geoscience and Remote Sensing Letters.
- Journal of Earth System Science

FUNDING AND PROJECTS

International

1. SATREPS 10/2021. Institución: Agencia de Cooperación Internacional de Japón. The project for numerical weather prediction and warning communication systems for densely populated and vulnerable cities. Investigadores responsables: Takemasa Miyoshi y Celeste Saulo.
2. LEFE-AO 2015-2016 (CNRS): «Analysis and validation of cloud and precipitation microphysical properties of deep moist convection over Southeastern South America (SESA), using observation and modeling tools».
3. RELAMPAGO: Remote Sensing of Electrification, Lightning, And Meso-scale/micro- scale Processes with Adaptive Ground Observations. PI: Stephen Nesbitt. Propuesta presentada a la National Science Foundation, 2016.

National (Argentina)

1. PIDDEF 09/2020. Institución: Ministerio de Defensa. Estimación cuantitativa de precipitación e inteligencia artificial: desarrollo regional de un producto multisensor sobre una plataforma satelital geoestacionaria. Investigadores responsables: Luciano Vidal y **Victoria Galligani**.
2. PICT-2021-CAT-I-00130. Institución: Agencia Nacional de Promoción Científica y Tecnológica. Herramientas que mejoran la comprensión de los procesos físicos y dinámicos relacionados con la ocurrencia de eventos meteorológicos de alto impacto. Investigador responsable: Manuel Pulido.
3. UBACyT 2018-2022. Institución: UBA. RELAMPAGO: una oportunidad para mejorar el entendimiento de los procesos físicos y dinámicos que inician y mantienen a los eventos meteorológicos de alto impacto. Investigador responsable: Paola Salio.

4. PICT I-A 2017-2021. Institución: Agencia Nacional de Promoción Científica y Tecnológica. Procesos físicos y dinámicos relacionados con la ocurrencia de eventos meteorológicos de alto impacto. Grupo responsable. Investigador responsable: Paola Salio.
5. PICT I-B 2016. Institución: Agencia Nacional de Promoción Científica y Tecnológica. Categoría: Investigador joven. Development of precipitation retrievals at microwave satellites wavelengths: application to regional deep convective events associated with severe weather. **Investigador responsable: Victoria Galligani.**
6. PICT 2013-1299. Institución: Agencia Nacional de Promoción Científica y Tecnológica. Categoría: Grupo en formado. Estrategias de detección y monitoreo de la convección húmeda profunda asociada a la generación de fenómenos severos. Aprobado Marzo 2014. Directora: Paola Salio. Co-directora: Yanina García Skabar.
7. PIDDEF 16/2014. Institución: Ministerio de Defensa. Categoría: Grupo formado. Sistema de asimilación de datos y pronósticos por ensambles en alta resolución para la alerta de fenómenos severos asociados a la convección. Directora: Yanina García Skabar.

Field Campaigns

1. RELAMPAGO (Remote sensing of Electrification, Lightning, And Mesoscale/microscale Processes with Adaptive Ground Observations), Provincia de Córdoba, Argentina. Nov - Dic. 2018. Mobile deployment team led by the Center for Severe Weather Research (CSWR).

COURSES

1. Aprendizaje Automático: Fundamentos y Aplicaciones en Meteorología del Espacio, 8-12 Agosto 2022. Departamento de Ciencias de la Atmósfera y los Océanos. Exactas. UBA.
2. Objective Analysis and Multi-Doppler Techniques, 22 November 2019, Buenos Aires, Argentina. Karen Kosiva (CSWR). Departamento de Ciencias de la Atmósfera y los Océanos. Exactas. UBA.
3. Using GOES 16 to nowcast convection over South America, 22 November 2019, Buenos Aires, Argentina. Steve Goodman (NASA-USA). Departamento de Ciencias de la Atmósfera y los Océanos. Exactas. UBA.
4. ECMWF/EUMETSAT NWP-SAF Satellite Data Assimilation Training Course. Reading, UK. March 14-18 2016.
5. Meteorological Radars. Dra. Paola Salio and Dr. Steve Nesbitt. May 2015. Departamento de Ciencias de la Atmósfera y los Océanos. Exactas. UBA.
6. Sistemas Precipitantes de Latitudes media. Dra. Salio and Dr. Ruiz. 2015. Departamento de Ciencias de la Atmósfera y los Océanos. Exactas. UBA.
7. Fundamentos de la Variabilidad Climática Global y en Sudamérica. Dra. Vera. 2014. Departamento de Ciencias de la Atmósfera y los Océanos. Exactas. UBA.

SUPERVISION OF STUDENTS

M.S. Students Supervised

1. Candela Casanovas. Estudio de los modos primarios de variabilidad de la distribución del tamaño de gotas de lluvia obtenida a partir de disdrómetros en la región del Sudeste de Sudamérica (SESA). M.S. 03/2020 (Outstanding). Supervisors: Dr. Victoria Galligani and Dr. Paola Salio.
2. Federico Cutraro. Generación de imágenes satelitales sintéticas a partir de pronósticos numéricos de la atmósfera. Tesis de Licenciatura para Ciencias de la Atmósfera. M.S. 03/2020 (Outstanding). Supervisors: Dr. Victoria Galligani y Dr. Yanina García Skabar.

PhD. Students Supervised

1. Paola Corrales. Utilización de datos satelitales para la evaluación y mejora de los pronósticos numéricos en alta resolución a muy corto plazo. Beca CONICET 2019 (ongoing). Directores: Dr. Juan Ruiz y Dra. Victoria Galligani.
2. Yazmin Velazquez. Estudio del Campo eléctrico atmosférico en diferentes estados de la atmósfera en el territorio de Argentina y sus implicancias en el pronóstico de eventos atmosféricos de alto impacto. Beca CONICET 2020 (ongoing). Directores: Dra. Gabriela Nicora y Dra. Victoria Galligani.

Other

1. Federico Cutraro. Generación de imágenes satelitales sintéticas a partir de pronósticos numéricos de la atmósfera. Beca de Capacitación profesional. Servicio Meteorológico Nacional (SMN). Supervisors: Dr. Victoria Galligani y Dr. Yanina Garcia Skabar.
2. Sofia Spago. Implementación de un algoritmo de aprendizaje automático con datos de diferentes sensores remotos para obtener un producto de estimación de precipitación en base a dos sensores del satélite GOES-16 (ABI y GLM) y productos microondas del satélite GPM. Beca de Capacitación profesional. Servicio Meteorológico Nacional (SMN). Supervisors: Dr. Victoria Galligani y Dr. Luciano Vidal.

Thesis Examination Committees

1. Franco Piscitelli (Licenciatura en Ciencias de la Atmósfera, 2019). "Tormentas supercelulares: adaptación de parámetros para su correcta detección y pronóstico de entornos". Supervised by Dr. Juan Ruiz and Dra. Paola Salio.
2. Sergio Gonzales (Tesis de Licenciatura en Ciencias de la Atmósfera, 2022). "Estimación de precipitación en base a datos satelitales en infrarrojo utilizando redes neuronales". Supervised by Dr. Juan Ruiz y Dr. Pablo Negri.

TEACHING

1. JTP dedicación parcial, Feb. 2020. "Sensoramiento remoto de la atmósfera desde el espacio". DCAO-FCEN-UBA.
2. JTP invitada, Feb. 2019. "Sensoramiento remoto de la atmósfera desde el espacio". DCAO-FCEN-UBA.
3. JTP invitada, 2016/2017. "Sensoramiento remoto de la atmósfera desde el espacio". DCAO-FCEN-UBA.

OTHER SKILLS

Languages

- Fluent English, French and Spanish
- Intermediate Italian and portuguese