

CURRICULUM VITAE

GIUSEPPE PAGNONI

March 27, 2023

STUDI E FORMAZIONE

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|---------------|--|
| 2020 | Abilitazione nazionale a Professore di Prima Fascia, settore concorsuale 05/D1, quinto quadrimestre. Validità dal 18/11/2020 al 18/11/2030. |
| 2015–presente | Professore Associato presso il Dip. di Scienze Biomediche, Metaboliche e Neuroscienze, Università di Modena e Reggio Emilia. |
| 2008–2015 | Ricercatore presso il Dip. di Scienze Biomediche, Metaboliche e Neuroscienze, Università di Modena e Reggio Emilia. |
| 2002–2008 | Assistant Professor presso il Dept. of Psychiatry and Behavioral Sciences, Emory University, Atlanta, GA. |
| 2000–2002 | Postdoc Fellowship negli Stati Uniti presso il Dept. of Psychiatry and Behavioral Sciences, Emory University, Atlanta, GA. |
| 1998–1999 | Borsa di Ricerca del Dipartimento di Scienze e Tecnologie Biomediche, Università di Udine (Tutor: Prof. Carlo A. Porro). |
| 1994–1998 | Dottorato in Neuroscienze, Università di Parma (Direttori: Prof. Giacomo Rizzolatti e Ruggero Corazza). Tesi: <i>Percezione ‘semantica’ e percezione ‘esplorativa’: uno studio di imaging funzionale sul riconoscimento implicito di stimoli visivi.</i> |
| 1992 | Laurea in Fisica, Università di Modena. |

RICERCA

Neuroimaging funzionale sull'uomo. Applicazione della teoria dell'inferenza attiva e della elaborazione predittiva (Bayesiana) alla modellizzazione dell'attività di circuiti neurali e processi cognitivi. Attività cerebrale intrinseca e sua rilevazione mediante tecniche di neuroimaging funzionale guidate dai dati. Studio dei correlati neurofisiologici delle pratiche meditative. Basi neurali dello sforzo mentale in individui sani e nella sindrome di affaticamento cronico. Ruolo dei gangli della base nei meccanismi di ricompensa e previsione. Meccanismi centrali della percezione del dolore. Interazione di funzione immunitaria, processi cognitivi e umore nel modello dell'interferone-alfa. Imaging funzionale di modelli di cognizione sociale.

Ha contribuito alla creazione del gruppo di ricerca interdisciplinare di neuroscienze computazionali "Neuromorphic Intelligence Laboratory (NILAB)" (<https://www.nilab.unimore.it/neuromodeling-research/>)

INDICI BIBLIOMETRICI (SCOPUS, MARZO 2023)

h-index: 33

Number of articles: 60

Sum of times cited: 7530

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2. Ballotta D, Maramotti R, Borelli E, Lui F, **Pagnoni G**. Neural correlates of emotional valence for faces and words. *Frontiers in Psychology*, 2023, 14:1055054.
3. Timmermann C, Bauer PR, Gosseries O, Vanhaudenhuyse A, Vollenweider F, Laureys S, Singer T, Mind and Life Europe (MLE) ENCECON Research Group (incl. **Pagnoni G**), Antonova E, Lutz A. A neurophenomenological approach to non-ordinary states of consciousness: hypnosis, meditation, and psychedelics. *Trends in Cognitive Sciences*, 2023, 27:139–159.
4. Gandolfi D, Puglisi FM, Boiani GM, **Pagnoni G**, Friston KJ, D'Angelo E, Mapelli J. Emergence of associative learning in a neuromorphic inferential network, *J Neural Eng*, 2022, 19(3):036022.
5. Ramstead MJD, Seth AK, Hesp C, Sandved-Smith L, Mago J, Lifshitz M, **Pagnoni G**, Smith R, Dumas G, Lutz A, Friston K, Constant A. From generative models to generative passages: A computational approach to (neuro) phenomenology. *Review of Philosophy and Psychology*, 2022, 13(4): 829–857.

6. Gandolfi D, **Pagnoni G**, Filippini T, Goffi A, Vinceti M, D'Angelo E, Mapelli J. Modeling early phases of COVID-19 pandemic in northern Italy and its implication for outbreak diffusion. *Frontiers in public health*, 2021, 9:724362.
7. Feruglio S, Matiz A, **Pagnoni G**, Fabbro F, Crescentini C. The impact of mindfulness meditation on the wandering mind: a systematic review. *Neurosci Biobehav Rev*, 2021, 131:313–330.
8. Lukemire J, Kundu S, **Pagnoni G**, Guo Y. Bayesian Joint Modeling of Multiple Brain Functional Networks. *J Am Stat Assoc*, 2020, 0:1–13.
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12. Lutz A, Mattout J, **Pagnoni G**. The epistemic and pragmatic value of non-action: a predictive coding perspective on meditation. *Current opinion in psychology*, 2019, 28:166-171.
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15. Khachouf OT, Chen G, Duzzi D, Porro CA, **Pagnoni G**. Voluntary modulation of mental effort investment: an fMRI study. *Scientific Reports*, 2017, 7:17191.
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19. **Pagnoni G**, Porro CA. Cognitive modulation of pain and predictive coding: Comment on “Facing the experience of pain: A neuropsychological perspective” by Fabbro and Crescentini. *Phys Life Rev*, 2014, 11(3):555-7.
20. Miller AH, Jones JF, Drake DF, Tian H, Unger ER, **Pagnoni G**. Decreased basal ganglia activation in subjects with Chronic Fatigue Syndrome: association with symptoms of fatigue. *PLoS One*, 2014, 9(5):e98156.
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61. Baraldi P, Porro CA, Serafini M, **Pagnoni G**, Murari C, Corazza R, Nichelli P. Bilateral representation of sequential finger movements in human cortical areas. *Neurosci Lett*, 1999, 269(2):95–98.

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- Ballotta D, Borelli E, Lui F, **Pagnoni G**. Negative facial expressions induce a late attentional retraction. *Human Brain Mapping 2022*, poster. Glasgow, UK.

- Borelli E, Ballotta D, Lui F, **Pagnoni G**. Neural correlates of emotional valence for innate and culturally-acquired stimuli. *Human Brain Mapping* 2022, poster. Glasgow, UK.
- Soldate J, **Pagnoni G**, Lisinski J, LaConte S. Spatiotemporal vector representation for event-related multivoxel pattern analysis. *Human Brain Mapping* 2018, poster. Singapore.
- **Pagnoni G**, Khachouf O, Chen G. Neural and behavioral correlates of the voluntary investment of mental effort. *Human Brain Mapping* 2013, poster. Seattle (WA), USA.
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- Jones JF, Rajendra J, Drake DF, Miller AH, Unger ER, Tian H, **Pagnoni G**. Interaction of self- and illness-related cognitive processing in the right anterior insula of CFS patients: an fMRI study. International Association for Chronic Fatigue Syndrome 2011. Presentazione orale (Dr. Jones).
- Miller AH, Jones JF, Drake DF, Tian H, Unger ER, **Pagnoni G**. Decreased Basal Ganglia Activation in CFS Subjects is Associated with Increased Fatigue. International Association for Chronic Fatigue Syndrome 2011, presentazione orale (Dr. Miller).
- **Pagnoni G**. The BOLD duty cycle of the ventral posteromedial cortex during attention to breathing predicts attentional skills. Human Brain Mapping 2011, poster. Quebec City, Canada.
- Inman C, James GA, Hamann S, Rajendra J, **Pagnoni G**, Butler A. Exploratory SEM reveals altered resting-state motor control network connectivity following stroke. Human Brain Mapping 2010, poster. Barcelona, Spain.
- Baraldi P, Molinari E, Nocetti L, **Pagnoni G**, Porro CA. Parcellation of the human premotor cortex by multimodal MRI. Human Brain Mapping 2009, poster. San Francisco (CA), USA.
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- **Pagnoni G**, Cekic M, Drake DF, Fornwalt FB, Raison CL, Berns GS. Topography and dynamics of resting state networks during meditation. *Society for Neuroscience* 2006, poster. Atlanta (GA), USA.
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- Capuron L, **Pagnoni G**, Berns GS, Kilts CD, Nemeroff CB, Miller AH. Interferon-alpha-induced pallidal activation: relevance to depression in the medically ill. *American College of Neuropsychopharmacology* 2003, poster.
- Capuron L, **Pagnoni G**, Berns GS, Kilts CD, Nemeroff CB, Miller AH. Fronto-striatal dysfunction in medically ill patients undergoing Interferon-alpha therapy: from symptoms to neural correlates. *American Psychiatric Association* 2003, poster. San Francisco (CA), USA.
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- **Pagnoni G**, Martin ME, Zink CF, Dhamala M, Berns GS. Decreased striatal response in heroin patients under methadone maintenance therapy. *Society for Neuroscience* 2002, Satellite Symposium: Mechanisms of Reward and Implications for Addiction, poster. Orlando (FL), USA.
- Zink CF, **Pagnoni G**, Martin ME, Dhamala M, Berns GS. Unexpected, behaviorally relevant events increases activity in the human striatum. *Society for Neuroscience* 2002, poster. Orlando (FL), USA.
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- Baraldi P, Porro CA, Serafini M, **Pagnoni G**, Tavani F, Nichelli P. Cortical areas shared by contra- and ipsilateral sequential finger movements. *Human Brain Mapping* 1998, poster. Montreal, Canada.

PRESENTAZIONI ORALI E PARTECIPAZIONI AD INVITO A SEMINARI E CONVEGNI

- Seminario di studi *The computational approach to neuro-phenomenology*. Leiden, Netherlands, 6–10 marzo, 2023.
- “Inferenza (In-)Attiva: aspetti pragmatici ed epistemici delle pratiche contemplative”. Lezione presso l’Istituto di Intelligenza Meccanica della Scuola di Studi Superiori Sant’Anna, Pisa, 20 febbraio 2022.
- Seminario di studi *Embodied experience of intersubjectivity: exploring the boundaries between Self and Other* (ENCECON-ICP 2022). Le Reposoir, Francia, 4–7 luglio 2022.
- “In-active inference: the epistemic value of contemplative practice”. Webinar per il ciclo *MLE Friends* del Mind & Life Europe, 6 aprile 2022.
- “La natura auto-epistemica dell’in-azione contemplativa”. Convegno *Dharma today: volti del buddhismo contemporaneo*, Palazzo Franchetti, Venezia, 13 marzo 2022.
- “The act of inaction”. Conferenza in streaming *Online CMC Contemplative Spring Institute* (CMC-CSI), 29 aprile 2021.
- “Seeing things ‘as they are’? Contemplative epistemology from the point of view of active inference”. Seminario di studi *Perspectives on Consciousness*, Neve Shalom, Israele, 20–22 febbraio 2020.
- Seminario di studi *Mechanisms of Meditation and Applications in Clinical Practice*, Lorentz Center, Leiden, Netherlands, 9–13 Dicembre 2019.
- “Living in the present, seeing things as they are and the empty mind: our favorite ‘contemplatitudes’ through the lenses of predictive coding”. Seminario di studi *European Neurophenomenology, Contemplative, and Embodied Cognition Network (ENCECON) Meeting*, Schloss Buchenau, Germania, 11–15 giugno, 2019.
- “The contemplative act in the imaginative, prophetic business of the mind”. Convegno *International Conference on Meditation*, Allahabad, India, 4–6 marzo 2018.

- “Predictive coding as a theoretical framework for contemplative research”. Seminario di studi *European Neurophenomenology, Contemplative, and Embodied Cognition Network (ENCECON) Meeting*, Château de la Bourlie, Francia, 6–10 giugno, 2016.
- “Suspending judgment in the mental courtroom: meditation through the lense of predictive coding”. Seminario di studi *Contemplative Summer Institute*, Karma Guen, Velez, Malaga, Spagna, 16–20 settembre 2015.
- “Remembrance of things to come: the restless brain between memory and (self-fulfilling) prophecy”. Seminario di studi *Mind and Life Summer Research Institute*, Garrison (NY), USA, 16 giugno 2014.
- “Remembrance of things to come: the restless brain between memory and (self-fulfilling) prophecy”. Convegno *Symposium on Mindfulness Research*, Radboud University, Nijmegen, Olanda, 22 maggio 2014.
- “The Self-Fulfilling Brain: Predictions, categories and what all this has to do with meditation”. Lezione magistrale al convegno *First International Conference on Mindfulness*, Roma, 8–12 maggio 2013.
- Seminario di studi *Models of consciousness and clinical implications*, Lorentz Center, Leiden, Netherlands, 2–6 aprile 2013.
- “The emptiness in mindfulness: an inquiry into the interaction of spontaneous thoughts and attentional processes during Zen meditation”. Seminario di studi *Mind and Life Summer Research Institute*, Garrison, NY, USA, 13 giugno 2011.
- “Pensare il non-pensiero: uno studio sulle basi neurali dell’elaborazione concettuale nella meditazione”. *La mindfulness: radici contemplative, evidenze neuroscientifiche e applicazioni cliniche*, Università di Roma “La Sapienza”, Dipartimento di Psicologia, Roma, 13 dicembre 2010.
- “Thinking about not-thinking: making sense of Zen meditation through the practice of neuroimaging”. Convegno *Neuroscience, Consciousness and Spirituality*, Freiburg, Germania, 26 febbraio 2010.
- “Molto rumore per nulla? Dati recenti e interpretazione dell’attività cerebrale spontanea osservata con l’fMRI”. Università di Modena e Reggio Emilia, Dipartimento di Scienze Biomediche, Modena, 12 ottobre 2007.
- Seminario “La risonanza magnetica funzionale”, *Tecniche di ricerca sperimentale nelle neuroscienze cognitive*, terzo corso della Associazione Psicologia Italiana (API), Bertinoro (FC), 8–10 ottobre 2007.
- “The Default Mode(s) of Meditation: Patterns of brain activity in the meditative state”. Convegno *From basic research to clinical interventions: cognitive-affective neuroscience and clinical applications of meditation*, University of Massachusetts Medical School, Worcester, MA, USA, 29 marzo 2007.
- “The askesis of meditation: neurophysiological hypothesis on Zen training”. Convegno *Aspects of Mind-Matter Research Symposium*, Wildbad Kreuth, Germania, 25 giugno 2003.

- “Imaging the brain in mood and neuropsychiatric disorders”. Convegno *Psychoneuroimmunology Research Society Meeting* (PNIRS), Amelia Island, FL, USA, 6 giugno 2003.
- “Uncertain Pleasures: Koolaid treats, brain imaging and other surprises”. Seminario per il ciclo *Frontiers in Neuroscience*, Neuroscience graduate program, Emory University, Atlanta, GA, USA, 26 aprile 2002.

ATTIVITÀ DI TERZO SETTORE

- “Meditation: an active state?”. Intervista per il podcast *The Contemplative Science Podcast* (Episodio 43, <https://www.thecontemplativescientists.com/episodes/episode-43>), 27 febbraio 2023.
- “Percezioni veridiche e illusorie nella teoria dell’inferenza attiva”. Convegno pubblico *Le Voci, L’Identità: Convegno sull’esperienza degli Uditori di Voci*, Reggio Emilia, 26 settembre 2022.
- “La teoria dell’inferenza attiva di Karl Friston: come il cervello-mente conosce (e costruisce) il mondo”. Convegno pubblico *Festival della neuroetica e del cervello sociale*, Cassino, 1 ottobre 2022.
- “Il valore epistemico dell’in-azione contemplativa”. Convegno pubblico ECM, *Le frontiere della scienza contemplativa: psicoterapia, neuroscienze, mindfulness e dharma*, Roma, 21 maggio 2022.
- “Il principio dell’energia libera per sistemi senzienti”, per il ciclo di lezioni in streaming *Being Sapiens* (<https://beingsapiens.it/> diretto da Gianandrea Giacomà. Episodio del 27 maggio 2022 (<https://youtu.be/oMJ35I6Bq54>))
- “Pratica meditativa, funzioni cognitive e comportamentali”. Seminario in streaming *Mindfulness e pratiche contemplative*, per il ciclo Medical Humanities, ECM Regione Piemonte, 14 giugno 2021
- “La coscienza e la mente predittiva”, intervento pubblico in streaming per il centro ASIA di Modena, in dialogo con Roberto Ferrari (https://youtu.be/EHd_XASqkYg), 12 dicembre 2020.
- “Profetica-mente: l’attività cerebrale come processo predittivo-inferenziale”. *Festival della Cultura Tecnica di Reggio Emilia - terza edizione*, in streaming 3 dicembre 2020.
- “L’esercizio contemplativo nell’attività profetico-immaginale della mente”. Convegno pubblico, 2° Giornata di studio in memoria del Dott. Stefano Setti, *Mindfulness: prospettive di ricerca clinica e cura di sé*, Modena, 23 novembre 2018.
- “L’esercizio contemplativo nell’attività profetico-immaginale della mente”. Convegno pubblico *Meditazione Buddhista e Neuroscienze*, Università della Sapienza, Roma, 14 aprile 2018.

- “In quest’andar ch’è star inavvenir: codifica predittiva dei processi mentali e meditazione”. Seminario scientifico-clinico pubblico *Stati alterati di coscienza*, organizzato dalla Scuola di Specializzazione di Psichiatria e dal CdL in Tecnica della Riabilitazione Psichiatrica, Università di Modena e Reggio Emilia, Modena, 2016.
- “Codifica predittiva dei processi mentali e meditazione”. Convegno pubblico, 1° Giornata di studio in memoria del Dott. Stefano Setti, *Mindfulness: il cielo della mente*, Modena, 20 novembre 2015.
- “Codifica predittiva dei processi cognitivi”, convegno *Scienza e Meditazione*, Pavia, 9–10 ottobre 2015.
- “Inquietamente, tra memoria e profezia: perché la Mindfulness funziona e perché è anche un rischio”. Convegno pubblico *Mindfulness-Mania*, Milano, 21 marzo 2014.
- “Dynamic BOLD changes during meditation and attentional skills”. Convegno pubblico *Brain Connectivity in Epilepsy and Sleep*. Camera di Commercio, Modena, 21 novembre 2013.
- “Molto rumore per nulla? Attività cerebrale intrinseca e percezione del mondo”. *Fine dell’immagine: tra media, neuroscienze e filosofia*, Palazzo Ducale, Genova, 27 maggio 2013.
- “Attività cerebrale spontanea e attenzione nell’esercizio meditativo”. Convegno pubblico, *Neuro-riduzioni, possibilità e limiti: l’indagine dell’esperienza cosciente a partire da Neuromania*, Università di Padova, Padova, 10 luglio 2012.

ATTIVITÀ DIDATTICA

- Metodologie Medico-Scientifiche di Base, Corso di Laurea in Medicina e Chirurgia, Università di Modena e Reggio Emilia, 2011–presente.
- Strumenti e modelli di analisi dei dati nella ricerca psicobiologica, Corso di Laurea in Scienze e Tecniche Psicologiche, Università di Modena e Reggio Emilia, 2017–presente.
- Fisiologia cardiovascolare nel Corso Integrato di Fisiologia Umana e Fisiopatologia, Corso di Laurea in Medicina e Chirurgia, Università di Modena e Reggio Emilia, 2008–presente.
- Neuroscienze della meditazione, Master in “Mindfulness: pratica, clinica e neuroscienze”, Dipartimento di Psicologia, Università di Roma, La Sapienza, 2015–presente.
- Meditazione e mente predittiva, Master in “Meditazione e neuroscienze”, Università di Udine, 2018, 2020–presente.
- Fisiologia cardiovascolare nel corso di Fisiologia Umana, Corso di Laurea Triennale di Tecniche di Fisiopatologia Cardiocircolatoria e Perfusionamento Cardiovascolare, anno II, Università di Modena e Reggio Emilia, 2008–2010.

COLLABORAZIONI INTERNAZIONALI IN CORSO

- Prof. Antoine Lutz, Director of Research, co-leader of the EDUWELL team: Experiential Neuroscience and Mental Training. Lyon Neuroscience Research Center, INSERM U1028 - CNRS UMR5292, Centre Hospitalier Le Vinatier (Bât. 452), 95 Bd Pinel, 69675 Bron Cedex, France. Collaborazione a diversi studi diretti ad indagare i meccanismi neurali e psicologici associati alle pratiche contemplative, soprattutto dalla prospettiva teorica dell'inferenza attiva.
- Prof. Ying Guo, Director, Center for Biomedical Imaging Statistics Department of Biostatistics and Bioinformatics Rollins School of Public Health, Emory University, Atlanta (GA), USA. Collaborazione allo sviluppo di tecniche statistiche multivariate avanzate per l'analisi *data driven* dei segnali di risonanza magnetica funzionale (fMRI) nell'uomo.

PROGETTI DI RICERCA

- 2022– UnaWireD *Anosognosia and delusions in the diseased brain*
Ente: EC (ERC starting grant 2021)
Ruolo: key collaborator
Principal Investigator: G. Zamboni
- 2022– FAR Dipartimentale *Inferential neuromorphic energy efficient systems - INES*
Ente: Università di Modena e Reggio Emilia
Ruolo: Co-PI
Principal Investigator: D. Gandolfi
- 2019– PRIN2017 *The good and the bad of sensory experience: understanding the impact of emotionally charged stimuli on cognition and behavior, and the brain's mechanisms to cope with them*
Ente: MIUR
Ruolo: Responsabile dell'Unità dell'Università di Modena e Reggio Emilia
Principal Investigator: L. Chelazzi
- 2018–2022 Fisiopatologia, fattori predittivi di aggravamento e fenotipo cognitivo-comportamentale nel paziente con disturbo cognitivo lieve (Mild Cognitive Impairment, MCI). Parte del finanziamento "Dipartimento di Eccellenza" assegnato al Dipartimento di Scienze Biomediche, Metaboliche e Neuroscienze.
Ente: MIUR

Ruolo: Investigator
Principal Investigator: Carlo A. Porro

2010–2012 *Neural and Behavioral Correlates of Mental Effort*
Ente: European Community (FP7-PEOPLE-2009-RG)
Ruolo: principal investigator

2010–2014 *Neurobiological and Genetic Correlates of Cooperative Behavior*
Principal Investigator: J.K. Rilling
Ruolo: consultant

2006–2010 *CDC's Chronic Fatigue Syndrome Research Program*
Principal investigator: W. Reeves / E. Unger
Ente: Center for Disease Control and Prevention (CDC)
Ruolo: co-investigator

2005–2007 *Mapping the social brain with fMRI and interactive games*
Principal Investigator: J.K. Rilling
Ente: National Science Foundation
Ruolo: co-investigator

2004–2009 *Cytokine-CRH interactions in IFN-alfa-induced depression*
Principal Investigator: C. Raison
Ente: National Institute of Mental Health (NIMH)
Ruolo: co-investigator

2004–2007 *Mental imagery to reduce motor deficits in stroke*
Principal Investigator: A. Butler
Ente: National Center for Complementary and Alternative Medicine (NCCAM)
Ruolo: co-investigator

2004 *Neural and autonomic correlates of Zen meditation: effects of training on a sustained focused attentional task*
Ruolo: principal investigator
Ente: Emory University Center for Research on Complementary and Alternative Medicine in Neurodegenerative Diseases

2003–2008 *The neurobiology of uncertainty*
Principal Investigator: G. Berns
Ente: National Institute on Drug Abuse (NIDA)
Ruolo: co-investigator

- 2003–2008 *Fronto-striatal dysfunction in IFN alpha-induced depression*
Principal Investigator: A. Miller
Ente: National Institute of Mental Health (NIMH)
Ruolo: co-investigator
- 2000–2005 *Integration of bifurcation theory and continuous fMRI*
Principal Investigator: G. Berns
Ente: National Institute of Biomedical Imaging and BioEngineering (NIBIB)
Ruolo: co-investigator