Valeria Vistoso

Marie Curie Ph.D Candidate at CNRS | vEM | Material and Nanotechnology Engineer

Welcome! I'm a Materials Science PhD at CNRS in Strasbourg (EU GAP project). I explore volumetric electron microscopy to study bone defects. Materials engineer from Polimi, passionate about research.

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Core business

PHASE 2 **Skill development**

During my PhD within the Marie Sk?odowska-Curie GAP programme, I combined scientific research with professional development focused on industry-relevant skills. I designed and optimised imaging protocols transferable to industrial R&D, managed complex projects across international teams, and followed training in innovation, intellectual property, and entrepreneurship. Presenting at conferences and engaging with cross-sector partners expanded my professional network. Regular mentoring helped me set clear objectives and identify opportunities to apply my expertise beyond academia.

Takes a critical look at his skills and experience and regularly fine-tunes his career goals.
Knows how to develop new skills to keep step with changing knowledge and needs.
Relies on advice from competent professionals (coaching) or experienced staff and takes their opinions into account; uses his networks to manage his career.
Is able to evolve gradually from technical expertise to managerial expertise.
Helps his staff develop their skills and networks and assists them in achieving career development goals.

PHASE 1 **Evaluation**

Throughout my PhD, I regularly assessed the quality and relevance of complex datasets, including 3D imaging and morphometric analyses of bone microarchitecture. I critically reviewed experimental protocols, optimised workflows, and evaluated the reproducibility of results to ensure high standards. Presenting my research at international conferences and publishing peer-reviewed articles helped me refine my ability to communicate findings and incorporate constructive feedback. I also served as a reviewer for the journal JOM, developing objective and balanced evaluations of scientific contributions.

Evaluates the value of various documents concerning his field of expertise.
Is able to judge his own results in terms of both quality and added value.
Is willing to expose ideas to a critical audience; takes others' opinions of his work into account.
Is willing to evaluate the work of other contributors and provides reasoned, realistic judgments of others' work.

PHASE 2 **Information management**

During my PhD, I conducted extensive literature reviews to map the state of the art in bone imaging and multiscale analysis, using bibliographic and patent databases. I designed data

management workflows to organise large 3D imaging datasets, ensuring traceability, reproducibility, and long-term accessibility. I routinely assessed the reliability and relevance of scientific publications, technical reports, and experimental data. Collaborating with IT specialists and data managers allowed me to implement effective solutions for storage, backup, and data sharing across international research teams.

Conducts advanced searches using a range of software solutions, resources and techniques, recognizing the advantages and limitations of each.
Masters the creation, organization, validation, sharing, storing and archiving of information and/or raw data and addresses the associated risks.
Understands the legal, ethical and security requirements of information management.
Is familiar with the value of, and uses, metadata.
Advises and assists his staff using information-gathering and management methods, critiquing sources and evaluating information and data.
Makes his staff aware of information security and legal and ethical requirements.

PHASE 2 **Expertise and methods**

My PhD research focused on developing and applying advanced volumetric electron microscopy (ATUM-SEM, FIB-SEM) and synchrotron tomography methods to study bone microarchitecture. I designed experimental protocols, selected appropriate techniques, and critically assessed alternative approaches to optimise imaging workflows. Collaborating with specialists in biomechanics and materials science helped me explore related fields and integrate complementary techniques. I documented workflows and analysed results using quantitative metrics. Presenting my work at conferences improved my ability to adapt arguments to different audiences. I also shared practical advice on imaging protocols with colleagues to support effective use of methods.

Is familiar with recent progress in fields related to his own.
Is able to engage in dialogue and collaboration with experts in other disciplines or fields of activity.
Takes ownership of new research methods and techniques.
Is able to document and evaluate his activities using statistical methods where applicable.
Can formulate complex problems that correspond to new challenges.
Is able to develop arguments in support of new projects.
Knows how to adapt his arguments to his audience.
Advises and assists his staff in making appropriate use of investigative methods, improving their performance and enhancing their skills.

Personal and relational qualities

PHASE 2 **Communication**

During my PhD, I communicated complex scientific results to diverse audiences, including specialists at international conferences and non-experts through outreach activities. I prepared persuasive presentations and adapted my language to different contexts, from peer-reviewed publications to interdisciplinary meetings. As an Italian native speaker who works daily in English and French, I have developed the ability to communicate effectively in multilingual environments. Managing my professional online identity and sharing research updates also strengthened my digital communication skills.

Adapts his register to communicate with experts in other fields at both the national and international levels.
Masters communication techniques for various contexts and media.
Communicates effectively when addressing a diverse and lay audience.
Knows how to address a community of professionals.
Educates and trains his staff in the use of digital communication technologies.
Is able to work and lead a group in at least English and one other world language.

PHASE 1 **Collaboration**

During my PhD, I built collaborative networks through the Marie Sk?odowska-Curie GAP programme, engaging with researchers from multiple European institutions. Working on shared

projects and co-authoring publications taught me to assess the benefits and constraints of partnerships. Regular exchanges with experts in biomechanics and materials science helped me broaden my perspective and identify common objectives. Participating in international conferences and workshops also helped develop a professional network beyond my core discipline.

Develops and maintains cooperative networks.
Knows how to build a professional network for his own and the company's benefit.
Is considered an authority in his field of expertise.
Is able to envisage his work in a partnership framework; evaluates the benefits and limitations of a partnership and identifies shared and conflicting interests.

PHASE 2 Analysis, synthesis and critical thinking

During my PhD, I applied critical thinking to adapt volumetric electron microscopy workflows to mineralised bone, challenging established protocols and proposing improvements. I combined insights from materials science and biomechanics to challenge conventional approaches and develop innovative solutions. Evaluating complex datasets requires independent analysis and synthesis to extract meaningful conclusions. Sharing my findings in international forums and discussing them with peers helped me refine my perspectives and adopt alternative analytical methods relevant to emerging research questions.

Knows how to apply his analyzing and synthesizing abilities to new fields.
Takes ownership of new analytical methods.
Has a novel and independent way of thinking and makes significant contributions.
Questions "business-as-usual" scenarios in his activity.
Advises his staff to help them develop their own capacities of analysis and synthesis.
Stimulates critical thinking among his peers and his staff.

PHASE 2 Open-mindedness and creativity

During my PhD, I combined concepts from materials science, biomechanics, and imaging to design innovative workflows for analysing bone microstructure. Working in an international environment challenged me to adopt new perspectives and explore alternative approaches beyond my initial expertise. Developing protocols for volumetric electron microscopy required creativity to overcome technical limitations. Engaging with researchers from different disciplines and cultures helped me broaden my vision and integrate diverse ideas into my project.

Explores related fields.
Conceives new projects to find answers to essential questions.
Encourages his staff to seek challenge, be curious and engage in scientific questioning.
Defines and carries out innovative interdisciplinary projects with the help of contributors from various backgrounds.
Serves as a vector of innovation, a realistic visionary, a constructive agitator.
Encourages creativity and innovation among his staff.
Has acquired professional experience abroad in a culture other than his own.

PHASE 2 Commitment

Throughout my PhD, I maintained a strong commitment and motivation while developing innovative imaging protocols in a complex, interdisciplinary context. Moving between materials science, biomechanics, and microscopy required perseverance and adaptability. Working in an international research environment helped me apply this dedication across different cultures and areas of expertise. I supported colleagues by sharing resources and encouraging collaborative problem-solving, contributing to a positive and engaged working atmosphere even when facing technical or experimental challenges.

Can picture himself in other contexts; applies his commitment and motivation to other activities and fields of expertise.
Perseveres in his undertakings and projects; paves the way for other staff and supports them.
Inspires the enthusiasm and commitment of his staff.

PHASE 2

Integrity

During my PhD, I ensured that all experimental data and publications respected ethical standards, confidentiality agreements, and intellectual property regulations. I was responsible for managing sensitive research data and for declaring potential conflicts of interest when collaborating with partners. Serving as a peer reviewer for JOM reinforced my commitment to integrity and transparency in evaluating others' work. I consistently honoured my commitments and maintained coherence between objectives, actions, and communication in collaborative projects.

Builds staff awareness of the need for responsible conduct of research.
Advises his peers and staff concerning matters of respect, confidentiality, anonymity and intellectual property.

PHASE 2

Balance

Throughout my PhD, I learned to manage the pressure of demanding research activities and long experimental timelines while maintaining a healthy balance between my personal life and academic pursuits. Facing unexpected technical challenges required resilience and the ability to stay focused without compromising well-being. I developed strategies to separate work and personal time, prioritise tasks effectively, and remain constructive even when dealing with setbacks or strong opposition. These experiences strengthened my capacity to draw on my strengths and maintain perspective in stressful situations.

Knows how to deal with strong opposition.
Draws on his strengths and transcends his weaknesses.
Knows how to cope with pressure generated by his career or his personal life.
Is able to keep his work and home environments separate.

PHASE 2

Listening and empathy

During my PhD, I worked in multidisciplinary teams where active listening and understanding different perspectives were essential. Regular discussions with colleagues from diverse backgrounds helped me appreciate their needs and expectations. I made a point of acknowledging their contributions and expressing gratitude for shared efforts. When facing experimental challenges, I supported peers by offering advice and encouragement, which helped build a constructive and respectful working atmosphere.

Knows how to engage in active listening in various situations.
Is careful to take his contacts' needs and frame of reference into account.
Expresses gratitude regularly.
Takes the needs of his staff into consideration, is sensitive to signs of stress and able to provide support and advice when needed.

Business management and value creation

PHASE 2

Project management

During my PhD, I managed complex experimental workflows that combined synchrotron tomography and electron microscopy. I planned schedules, prioritised tasks, and adjusted objectives when unexpected challenges arose, such as technical failures or delays in data acquisition. Coordinating with international partners required clear communication of expectations and timelines. By monitoring progress and identifying gaps early, I ensured the successful completion of milestones and delivery of results within tight deadlines. These experiences strengthened my ability to manage demanding projects autonomously.

Is attentive to discontinuities, trends and weak signals; is prepared for the unexpected; identifies unforeseen opportunities in the project.
Recognizes good ideas and best practices, identifies weaknesses and gaps.
Considers and implements any necessary changes in objectives, organization, schedule,

resources and quality requirements.
Knows how to drive his staff in compliance with scheduling and time constraints.
Utilizes a wide range of project management strategies; clarifies priorities and formalizes expectations.
Introduces quality systems.
Guides difficult, complex projects to successful completion; manages several projects simultaneously and efficiently; can intervene to conduct project audits and propose action plans to get projects back on track.
Provides support or assistance to his staff; takes over on projects that lack leadership.

PHASE 2 **Managing change**

During my PhD, I led the introduction of new preparation protocols for volumetric electron microscopy on mineralised bone, replacing established methods. To secure acceptance, I demonstrated early positive results and shared evidence of improved data quality with colleagues. When technical challenges emerged, I analysed potential causes of failure and adapted procedures accordingly. Collaborating with researchers from different backgrounds helped me build support for these changes and maintain momentum in implementing innovative workflows.

Is able to get people to see the need for change.
Defines objectives and rallies support for them.
Creates momentum and builds alliances.
Achieves initial results rapidly.
Understands the possible causes of the failure of a change plan.

PHASE 1 **Managing risks**

Throughout my PhD, I identified and addressed technical and organisational risks associated with complex imaging workflows, including equipment failures, sample preparation issues, and data loss. I implemented preventive measures, including detailed protocols, backup strategies, and contingency plans to minimise disruptions. Collaborating with project partners helped me anticipate potential challenges during experiments and improve overall risk awareness. These experiences strengthened my ability to assess and manage risks inherent in innovative research activities.

Can determine the risks related to his project and the means for controlling them.
Is aware that technological and financial risks increase during the innovation process.
Understands the concept of corporate social responsibility.

PHASE 2 **Decision-making**

During my PhD, I made decisions about experimental priorities, protocol adjustments, and data analysis strategies in a context where resources and time were limited. I learned to weigh the trade-offs between technical optimisation and practical constraints. For example, I sometimes had to prioritise reproducibility over resolution to meet project deadlines. When initial decisions did not yield the expected outcomes, I critically re-evaluated them and implemented alternative approaches. This experience enhanced my confidence in taking responsibility for my choices and adapting when necessary.

Realizes that no one solution is perfect; can reconcile the imperatives of the market with the quest for technical optimization.
Is able to make choices and assume the consequences of his decisions; has the ability to reconsider decisions when needed.

PHASE 1 **Producing results**

During my PhD, I transformed innovative imaging approaches into validated protocols for analysing bone microstructure. I iteratively tested and refined preparation and acquisition methods, learning from each experimental cycle. Publishing peer-reviewed articles and presenting at conferences requires familiarity with research dissemination processes and intellectual property considerations. Collaborating with partners helped me identify the most

effective ways to share results and ensure their relevance for both academic and potential industrial applications.

Knows how to transform ideas into innovations.
Quickly deploys prototype and test phases; involves internal and external customers in these phases.
Learns the lessons of the initial tests.
Understands the policies and processes involved in publishing and exploiting research outcomes in his entity.
Is able to determine the most appropriate means of exploiting his results (e.g., patent, publication).

PHASE 1 **Intellectual and industrial property**

During my PhD, I received training in intellectual property and data confidentiality, learning how to manage sensitive research information appropriately. Preparing publications and presentations required careful consideration of when and how to disclose results. I also gained awareness of the benefits and limitations of patenting research outcomes, as well as the importance of protecting proprietary methods when collaborating with external partners.

Has basic knowledge of the rules of intellectual/industrial property and copyright as they apply to his own activities.
Understands the advantages and drawbacks of filing a patent.
Is aware of the importance of controlling the release of information.

Strategy and Leadership

PHASE 1 **Strategy**

During my PhD, I learned to position my project within the strategic priorities of the Marie Sk?odowska-Curie GAP programme and the broader field of biomaterials research. Collaborating with international institutions made me aware of how different stakeholders and partners contribute to advancing shared objectives. Engaging with project coordinators and senior researchers helped me understand their motivations and the potential impact of my work on collective goals. This experience strengthened my ability to connect individual contributions to wider strategic directions.

Is aware of how his project fits into the organization's strategy and the strategic directions of the sector or field of activity.
Understands relationships between entities and individuals (the role and drivers of each).
Is able to identify influent people that support his projects and understand what they stand to gain from it.

PHASE 1 **Leadership**

During my PhD, I demonstrated leadership by taking the initiative to improve experimental workflows and share best practices with colleagues. I contributed to building trust and constructive relationships within international research teams. By actively supporting others in solving technical issues and coordinating shared activities, I helped create a collaborative environment. These experiences developed my ability to be persuasive, mobilise collective skills, and encourage engagement even without formal authority.

Exercises leadership in connection with a project of which he is in charge.
Knows how to be persuasive and enlist support for a project
.Mobilizes skills for a project of which he is not in charge; manages human resources even when people do not officially report to him.
Builds alliances.
Establishes relationships based on trust.