CURRICULUM VITAE

Name:	IONESCU
First name:	PALTIN
Date of birth:	August 9, 1951
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Main field of interest:

ALGEBRAIC GEOMETRY

Studies:

1975: Master in Algebraic Geometry, University of Bucharest

1984: Ph.D. Thesis: *Submanifolds of small degree of the complex projective space*, defended on 15.12.1984 at the University of Bucharest, under the supervision of Professor Gh. Galbură.

Positions:

1975–1980: High school teacher, Bucharest

1980– 1990: Assistant professor, Department of Mathematics, University of Bucharest

1990–1996: Associate professor, Department of Mathematics, University of Bucharest

Since 1996: Full professor, Department of Mathematics, University of Bucharest

Since 2001: Senior researcher, Institute of Mathematics of the Romanian Academy, Bucharest

Visiting-professor positions:

1990: Paris VII (March–April 1990)

1991: Bayreuth (November–December 1991)

1994: Humboldt-Berlin (November 1994)

1994–1997: Angers (January–June 1994, January–June 1995, February–April 1996, February–April 1997)

1998: Geneva (January–July 1998)

1999: Montpellier (February–July 1999)

2000–2003: Angers (April–May 2000, February–April 2002, March 2003)

2003: Genoa (October 2003)

2004: Lille (March 2004)

2005–2008: Genoa (“Rientro Cervelli”)

Distinctions:

I was awarded the prize “Simion Stoilow” by the Romanian Academy in 1986.

Talks:

I was an invited speaker at the international conferences/workshops from: Bucharest (1980, 1981, 1982, 1989, 2007), Eisenach (1982), Bayreuth (1990), Cetraro (1990), L'Aquila (1988, 1992), Tokyo (1990), Constanţa (1996, 2002, 2010), Budapest (2001), Piteşti (2001), Siena (2004), Genoa (2006, 2008, 2010), Nice (2007), Madrid (2007, 2009), Rio de Janeiro (2007), Sibiu (2009), Trento (2007), Cluj (2010), Daejon (2010).

I delivered several (series of) talks during my visits to the following universities: Berlin(1984, 1994), Paris VII (1990), Orsay (1990), Bayreuth (1991), Pisa (1992), Angers (1994, 1995, 1996, 1997, 2000, 2002, 2009), Nantes (1994, 1997), Bordeaux (1997), Geneva (1998), Genoa (1998, 2003, 2005, 2006), Montpellier (1999), Rome (2003, 2007), Lille (2004), Milan (2005), Ferrara (2006), Madrid (2007), Turin (2008), Nice (2008), Catania (2009), Ann Arbor (2009).

Summer Schools: Gargnano 2007; Perugia 2008; Catania Pragmatic 2010.

Teaching and supervising:

Since 1980 I was responsible for courses and seminars on Algebra and Algebraic Geometry at the University of Bucharest. They went from the undergraduate level up to the doctoral level. I taught also (in English, French and Italian) at the Universities of Angers, Geneva, Genoa and Montpellier.

Since 1980 I was frequently lecturing in the Algebraic Geometry Seminar organized jointly by the Institute of Mathematics of the Romanian Academy and the Department of Mathematics of the University of Bucharest.

Among the students that I supervised or influenced, let me mention: C. Anghel (Bucharest), A. Buium (USA), A. M. Castravet (USA), I. Ciocan-Fontanine (USA), D. Deliu (USA), O. Dumitrescu (USA), E. Halanay (France), V. Lozovanu (USA), V. Masek (USA), M. Mustata (USA), M. Popa (USA), M. Paun (France), D. Naie (France), S. Popescu (USA), C. Voica (Bucharest), M. Voineagu (USA).

Research

A. **Geometry of embedded projective manifolds**

1. Contributions to the theory of the classical adjunction (see [6], [11]).

If H is the hyperplane section and K the canonical divisor of a projective manifold of dimension n, the linear system $|K + (n-1)H|$ is the *classical adjoint system*. The works of A.J. Sommese, A. Van de Ven, I. Reider, F. Serrano and myself led to the following two theorems on the rational map φ associated to the adjoint system.

(a) A precise description of all cases when φ is not a morphism.

(b) A precise description of all cases when φ is not an embedding.

2. A quantitative study of embedded manifolds (see [3], [6], [10], [12]).

Using the results on the adjunction mapping, one obtains (maximal) lists of embedded manifolds with "small" invariants (Δ-genus, sectional genus, degree). Various techniques are used in order to make the maximal lists effective. In particular, a complete classification of embedded manifolds of degree ≤ 8 is obtained.

3. A qualitative study of embedded manifolds (see [8], [11], [21], [23]).

Manifolds whose degree is "small" with respect to codimension are described. If $X \subset \mathbb{P}^n$ is a non-degenerate manifold of degree $\leq n$, we proved that either X is a Fano manifold with $b_2 = 1$, or X is rational and completely classified. In particular, we get that any such manifold is simply connected; this topological result (for which $d \leq n$ is an optimal bound) was not known previously.

4. Small codimensional varieties (see [13]).

According to famous results due to Barth and Ellingsrud-Peskine, manifolds of small codimension have remarkable topological and geometrical properties.

Finiteness and classification results for special classes of such manifolds are obtained (Fano varieties, scrolls, arithmetically Cohen-Macaulay varieties).

5. A study of very ample vector bundles on curves (see [14]).

B. **Classification of polarized pairs in the context of Mori theory** (see [9], [15], [25])

1. An estimation for the dimension of the locus of rational curves belonging to an extremal ray.

2. A theorem on the adjoint systems of polarized pairs, having numerous applications (e.g. to the classification of polarized pairs by their sectional genus).

3. An extension theorem for adjoint morphisms defined on an ample divisor to the ambient variety. Applications include several results due to L. Bădescu, T. Fujita, A.J. Sommese.

C. **Birational geometry of rationally connected manifolds** (see [16], [18], [19], [20])

J. Kollár, Y. Miyaoka and S. Mori introduced in 1992 the class of rationally connected manifolds, a very useful generalization of rational manifolds. A "birational-biregular" point of view in their study is introduced, based on the notion of "model", a pair (X, Y), where Y is a smooth rational curve in X with ample normal bundle. Several characterizations of the model ($\mathbb{P}^n$, line) are obtained. We prove that, after suitable blowing-up, the normal bundle of Y becomes that of a line in $\mathbb{P}^n$. Such curves, called quasi-lines, turn out to be useful in investigating the birational geometry of X, in particular for detecting rationality (or unirationality). The formal geometry of such curves is investigated, generalizing Hironaka's result on lines in $\mathbb{P}^n$.

D. **Geometry of defective manifolds** (see [24], [26], [27])

Secant defective or dual defective embedded manifolds are classically studied objects of great interest. Together with Francesco Russo we are studying a special class of secant defective manifolds, called (local) quadratic entry locus, which are rationally connected (by conics) and have many interesting properties. In particular, they include Severi and Scorza varieties which were classified by F. Zak. We have also related them to dual defective manifolds.

E. **Geometry of manifolds covered by lines, Fanos of high index and special cases of the Hartshorne Conjecture** (see [22], [27])

A systematic study of manifolds covered by lines gives strong applications, such as:

The classification of manifolds covered by high dimensional linear spaces or hyperquadrics, characterizing scrolls among dual defective manifolds (a generalization of a result by L. Ein) and also attacking special cases of the famous Hartshorne Conjecture. Together with F. Russo we proved this conjecture for quadratic manifolds and classified all border cases.

Citations:

Our papers have been quoted by some 165 mathematicians in about 550 citations. We mention the names of J. Alexander, L. Bădescu, C. Bănică, A. Buium, F. Campana, F. Catanese, C. Ciliberto, L. Chiantini, W. Decker, L. Ein, H. Flenner, T. Fujita, K. O'Grady, M. Gross, K. Hulek, J-M. Hwang, V. A. Iskovskikh, Y. Kawamata, S. Kebekus, J. Kollár, A. F. Lopez, M. Mella, R. Miranda, Y. Miyaoka, Y. Namikawa, C. Okonek, T. Peternell, R. Piene, I. G. Prokhorov, F. Russo, F. Sakai, M. Schneider, F-O. Schreyer, N. Shepherd-Barron, A. J. Sommese, E. Tevelev, A. Van de Ven, J. Wiśniewski, F. L. Zak.

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Paltin Ionescu