



2014 Wireless Innovation Forum European Conference on Communications Technologies and Software Defined Radio (WInnComm-Europe 2014)

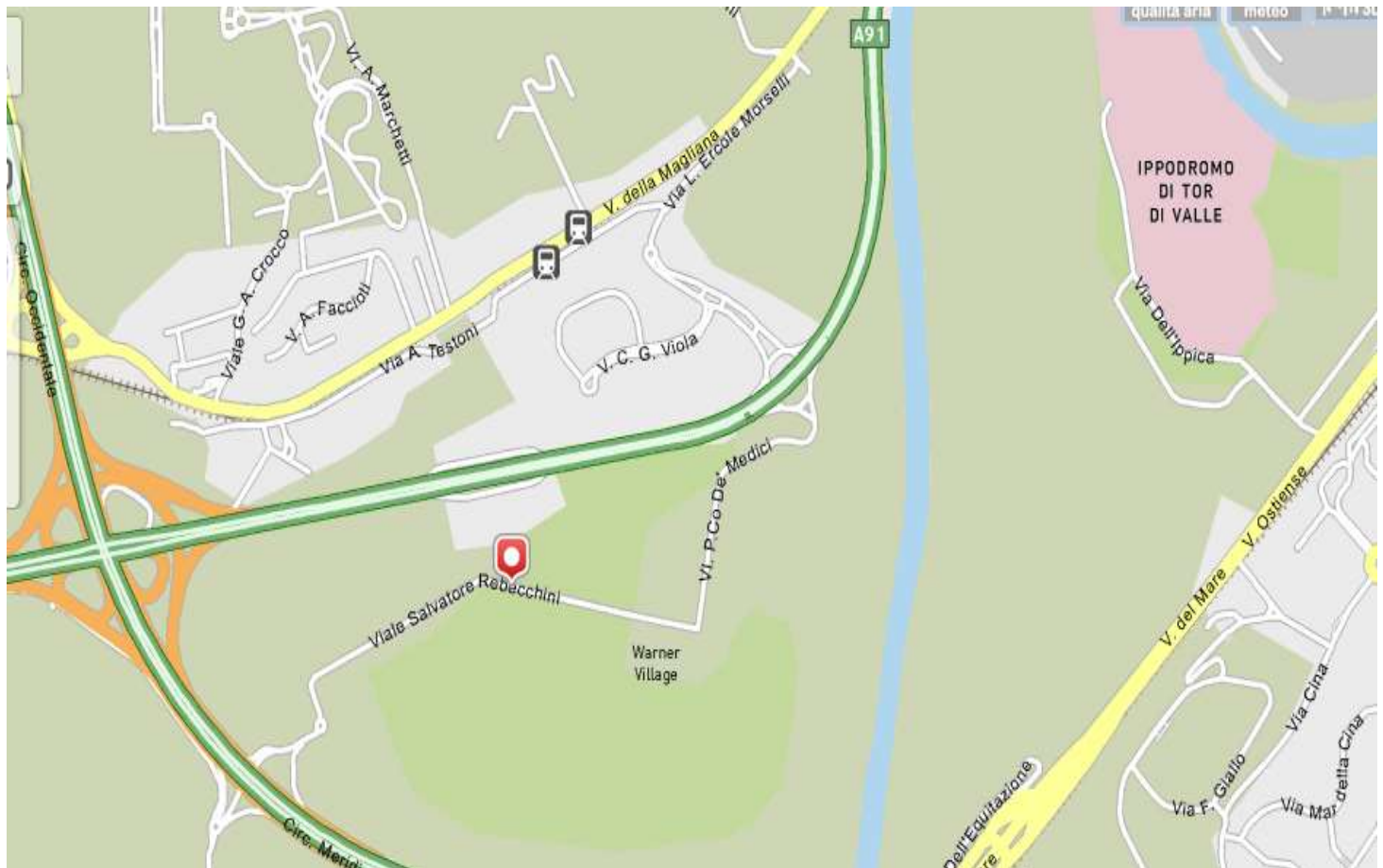


4-6 November • Rome, Italy

Meeting Details

Dates: 4th-6th November 2011

Venue: Sheraton Golf Parco De' Medici Hotel & Resort
Address: Viale Salvatore Rebecchini, 39 Rome
Phone: (+ 39) 06-65288



Agenda

Monday, 3 November 2014

- 13:00 Spectrum Innovation Committee Steering Group (*Malatesta*)
 15:00 Coordinating Committee on International SCA Standards Steering Group (*Malatesta*)
 17:00 Coordinating Committee on International SCA Standards Steering Group (*Malatesta*)

Tuesday, 4 November 2014

07:00	Registration			(08:00) Meeting Opening Plenary Presentation of the Dynamic Spectrum Sharing Annual Report by Lee Pucker, WinnForum CEO (<i>Malatesta</i>) (09:30) Networking and Refreshments	
10:00	Conference Opening (<i>Loggia dei Signori</i>) Keynotes: Amm. Di Biase, Italian MoD, "Vision of the SDR in National/International Programmes" Giampaolo Lillo, European Defense Agency Yrjölä Seppo, Nokia Networks, "Licensing Shared Access to Spectrum" and Invited Presentations			Open	
12:00	Lunch (<i>Visconti 1</i>) Keynote: Dr. Joseph Mitola, Federated Wireless, "Shared Spectrum Challenges and Opportunities for US EU Partnerships" and Invited Presentations				
13:30	<u>Technical Session 1A:</u> <u>Waveform SW on SDR/SCA</u> chaired by Marc Adrat, <i>Fraunhofer, FKIE</i> (<i>Loggia dei Signori</i>)	<u>Workshop 1B:</u> <u>Spectrum Sharing and Spectrum Management</u> chaired by Dania Marabissi, <i>University of Florence, Italy</i> (<i>Visconti 2</i>)	Open	Open	International Tactical Radio Special Interest Group (<i>Malatesta</i>)
15:00	Networking and Refreshments (<i>Visconti 1</i>)				
15:30	<u>Technical Session 2A:</u> <u>Waveform SW on SDR/SCA</u> chaired by Antonio DiRocco, <i>Selex ES</i> (<i>Loggia dei Signori</i>)	<u>Workshop 2B:</u> <u>Spectrum Sharing and Spectrum Management</u> chaired by Dania Marabissi, <i>University of Florence, Italy</i> (<i>Visconti 2</i>)	Tutorial 2C SCA 4.1 Preview (<i>Monferrato</i>)	Open	International Tactical Radio Special Interest Group (<i>Malatesta</i>)
18:00				Annual General Meeting (<i>Malatesta</i>)	

Wednesday, 5 November 2014

08:30	<p><u>Tactical Radio Workshop Plenary:</u></p> <p>Keynotes: Christian Serra and Philippe Margot, <i>OCCAR/a4ESSOR</i> and Charles Chedhomme, <i>French MoD</i>, Update on the French National Programme</p> <p>Invited Presentation: Amm. Gabrielli, <i>Italian MoD</i>, "The SDR capability in the Future Land & Maritime Scenarios" (<i>Loggia dei Signori</i>)</p>			Open	Open
10:00	Networking and Refreshments (<i>Visconti 1</i>)				
10:30	<p><u>Workshop 3A:</u> <u>Tactical Radio</u> chaired by Fabio Casalino, <i>Selex ES</i> and David Renaudeau, <i>Thales</i> (<i>Loggia dei Signori</i>)</p>	<p><u>Workshop 3B:</u> <u>Spectrum Sharing and Spectrum Management</u> chaired by James Neel, <i>Cognitive Radio Technologies</i> (<i>Visconti 2</i>)</p>	<p><u>Workshop 3C:</u> <u>CloudRAN</u> This session has been canceled and the papers reassigned. Please click on the session title to see the reassignments.</p>	Open	SCA Test and Evaluation Work Group (<i>Malatesta</i>)
12:00	Lunch, Exhibits and Posters (<i>Visconti 1</i>)				
14:00	<p><u>Workshop 4A:</u> <u>Tactical Radio</u> Fabio Casalino, <i>Selex ES</i> and David Renaudeau, <i>Thales</i> (<i>Loggia dei Signori</i>)</p>	<p><u>Session 4B:</u> <u>Context Aware Cognitive Radio</u> chaired by Christophe LeMartret, <i>Thales</i> (<i>Visconti 2</i>)</p>	Open	Receiver Performance Guidelines and Evaluation Criteria Task Group (<i>Monferrato</i>)	SCA Evolution (13:00-14:30) (<i>Malatesta</i>)
15:30	Networking and Refreshments (<i>Visconti 1</i>)				
16:00	<p><u>Workshop 5A:</u> <u>Tactical Radio</u> Fabio Casalino, <i>Selex ES</i> and David Renaudeau, <i>Thales</i> (<i>Loggia dei Signori</i>)</p>	<p><u>Workshop 5B:</u> <u>Software Defined Radio</u> Chaired by Sarvpreet Singh, <i>Fraunhofer FKIE</i> (<i>Visconti 2</i>)</p>	Open	Public Safety Special Interest Group (<i>Monferrato</i>)	SCA Implementers (<i>Malatesta</i>)
17:00	Reception, Exhibits and Posters (<i>Visconti 1</i>)				

Thursday, 6 November 2014

08:30	Workshop 6A: Tactical Radio Fabio Casalino, <i>Selex ES</i> and David Renaudeau, <i>Thales (Loggia dei Signori)</i>	Workshop 6B: Software Defined Radio chaired by Gerald Ulbricht, <i>Fraunhofer IIS (Pepoli)</i>	Open	Cognitive Radio Work Group (<i>Malatesta</i>)	CC SCA Advocacy Work Group (<i>Monferrato</i>)
10:00	Networking and Refreshments (<i>Visconti 2</i>)				
10:30	Workshop 7A: Tactical Radio Fabio Casalino, <i>Selex ES</i> and David Renaudeau, <i>Thales (Loggia dei Signori)</i>	Workshop 7B: Software Defined Radio chaired by Gerald Ulbricht, <i>Fraunhofer IIS (Pepoli)</i>	Open	Cognitive Radio Work Group (<i>Malatesta</i>)	CC SCA Advocacy Work Group (<i>Monferrato</i>)
12:00	Lunch Keynote (<i>Visconti 2</i>) Oliver Holland, King's College London, "TV White Spaces in the UK, and a Major Trial within the Ofcom TV White Spaces Pilot"?				
13:30	Keynotes (<i>Loggia dei Signori</i>) John McHale, Military Embedded Systems Magazine, "Global SDR in the Defense Communication Market" and Andreas Pascht, <i>Alcatel Lucent/Bell Labs,</i> "Multiband / Multistandard Radio Front-end" Invited Presentation: Gerald Ulbricht, <i>Fraunhofer IIS,</i> "Will there be the all digital radio in the future?" Endnote				
17:00				Board of Directors Meeting (closed) (<i>Malatesta</i>)	

Exhibitors

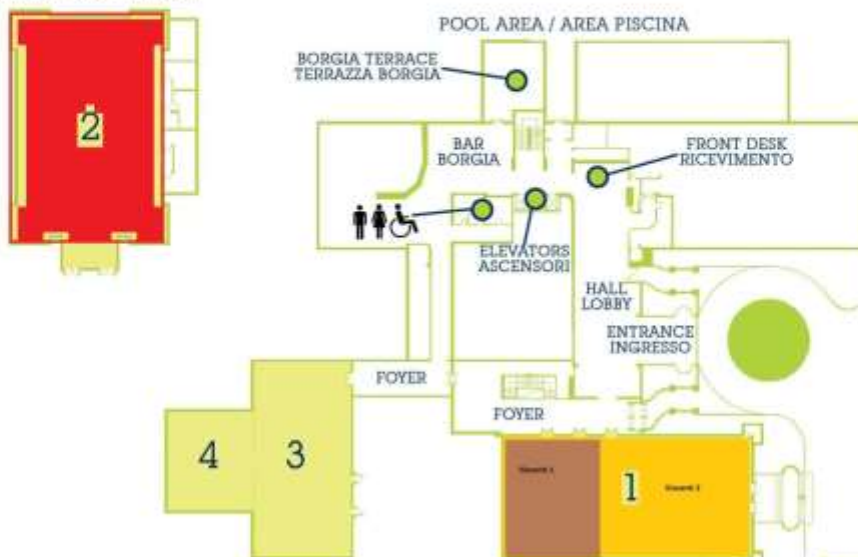
- Selex ES
- Rohde & Schwarz
- Reservoir Labs
- Prism Tech
- Nordia Soft
- Ettus Research

Sheraton Golf Parco De' Medici Hotel & Resort PLAN:



SHERATON GOLF 1

GROUND FLOOR / PIANO TERRA



LOWER FLOOR / PIANO INFERIORE



ROOM DIMENSIONS AND SEATING CAPACITY • DIMENSIONI SALE E CAPACITÀ RICETTIVA

N	Room Name • Nome Sala	Dimensions • Dimensioni		Height • Altezza		Area		Capacity • Capacità		
		Meter	Foot	Meter	Foot	Meter	Foot	Banquet	Theatre	Classrooms
Ground Floor • Piano Terra										
1	Sala Visconti (Meeting Room - Visconti / Sala 10)	14,75x29,7	48,4x97,5	2,50-5,0	8,2-16,5	438	4715	360	550	220
2	Loggia del Signor (Auditorium Hall)	27,7x17,75	90,9x61,5	4,74	15,5	492	5295	400	462	250
3	Savoia Restaurant • Ristorante	11,8x23,6	38,7x77,4	2,50-5,0	8,2-16,5	280	3014	-	-	-
4	Savoia Terrace • Terrazzo	10,3x12,0	33,8x39,4	4,0	13,5	124	1335	-	-	-
Lower Floor • Piano Inferiore										
5	Salone dei Medici	14,75x29,7	48,4x97,5	4,1	13,5	438	4715	300	550	250
6	Sala Cosimo	14,75x10,25	48,4x33,6	4,1	13,5	151	1626	60	110	80
7	Sala Giuliano	14,75x8,0	48,4x26,3	4,1	13,5	118	1270	30	90	80
8	Sala Lorenzo	14,75x11,5	48,4x37,7	4,1	13,5	170	1858	70	130	100
9	Sala Pepoli	10,0x9,5	33,0x31,2	2,5	8,2	100	1080	60	80	80
10	Sala Estensi	12,0x4,3	39,4x14,1	2,5	8,2	52	560	-	22	-
11	Sala Monteferrato (MEETING ROOM)	8,25x7,7	27,0x25,2	2,5	8,2	64	680	22	32	22
12	Sala Montefeltro (MEETING ROOM)	8,25x7,7	27,0x25,2	2,5	8,2	64	680	22	32	22
13	Sala Malatesta (MEETING ROOM)	8,25x7,7	27,0x25,2	2,5	8,2	64	680	22	32	22
14	Sala Manfredi	8,25x7,7	27,0x25,2	2,5	8,2	64	680	22	32	22
15	Sala Monaldeschi	8,4x7,95	27,6x26,1	2,5	8,2	67	721	22	32	22
16	Sala Scaligeri	12,0x4,3	39,3x14,1	2,5	8,2	52	554	-	22	-
17	Sala Gonzaga	8,0x8,0	26,2x26x2	2,5	8,2	64	680	22	32	22
18	Sala Guinigi	8,0x8,0	26,2x26x2	2,5	8,2	64	680	22	32	22
19	Sala Baglioni	8,0x5,0	26,2x16,4	2,5	8,2	40	429	-	20	-
20	Sala Carrara	8,0x5,0	26,2x16,4	2,5	8,2	40	429	-	20	-

Sheraton Golf Parco de' Medici Hotel & Resort

Viale Salvatore Rebecchini, 39 - 00148 Roma, Italia
 T +39 06 65288 F +39 06 6528 7060
 e-mail: info@sheratongolf.it
 www.sheraton.com/golfrome

Public Transport in Rome

The most convenient and economic way of getting around Rome is by far the Public Transit Bus service.

Buses run 24 hrs a day and cover the entire city. Bus tickets and subway metro tickets are interchangeable within the time validity of the ticket. Validation begins by punching tickets into the counter found on either the bus or subway. Keep the ticket with you at all times during your trip because if checked by a controller, you could get a fine ranging from € 40 to € 70.

Tickets can be purchased in advance at any tobacconists (easily found by the blue sign with a capital T outlined in white found throughout the city) and from vending machines at both the train and metro stations.

Tickets are not considered used until they are validated, so you can keep a supply of them.

Different choices of tickets include: The BIT, € 1,00, the most common and economic that lets you ride any bus or metro within a time period of 75 minutes.

The BIG, € 4,00, is a full day ticket and valid for unlimited rides on buses and the metro until midnight of the day it was purchased. The BTI, a special ticket for tourists, € 11,00, is valid for unlimited bus and metro travel for 3 days from the date validated. Special children's fares: children under ten ride free!

Other types of special tickets are available through the ATAC (Agenzia dei Trasporti Autoferrotranviari del Comune di Roma). Bus stops normally have yellow signs with each bus line listed on the sign. The lists will show all the stops for that line, with the current stop in a red rectangle. The type of bus will also be noted at the top: Express (few stops), Urbano (normal), Notturmo (night).

Metro stop and train stations are also indicated on the bus signs. At the bottom of each column, you will find the hours for that bus line.

TAXI Services

Official Rome taxis are white with an identification code on the door, and have a taxi meter. Inside, on the left door of the back seat, there is a plaque indicating the license number and the name of the driver or of the taxi company of which he is a member. In accordance with municipal regulations fares must be visible inside the taxi, translated in seven languages: English, French, German, Spanish, Portuguese, Arabic and Japanese. Taxis can also be called by telephone at the following numbers: 06.3570 / 06.6645 / 06.8822 / 06.4157 / 06.4994 / 06.5551. An operator will contact the taxi closest to you and provide the identification code that will allow you to recognize it, and how many minutes the wait will be.

SHUTTLE BUS SERVICE- SHERATON GOLF PARCO DE' MEDICI

A shuttle bus service is available from the Hotel to the centre of the city. Please see below the courtesy bus timetable

DEPARTING FROM Sheraton Golf Parco de' Medici Hotel & Resort	DEPARTING FROM Via Luigi Petroselli
10:00	10:30
11:15	11:45
12:30	13:10
13:50	14:20
16:30	17:00
19:30	20:00
21:00	21:30
22:00	22:30

Further departures to and from Leonardo Da Vinci Airport are available against payment, please contact the reception.

METRO

Rome offers 2 metro lines, Line A (red line) and Line B (blue line), and their entrances are indicated by a large red sign marked with an M. Line A runs from Battistini to Anagnina and includes stops near the Vatican Museums (Cipro), the Vatican (Ottaviano), the Cola di Rienzo shopping area (Lepanto), Piazza del Popolo (Flaminio), the Spanish Steps (Piazza di Spagna), Via Veneto (Barberini) and San Giovanni.

Line B runs from Rebibbia to Laurentina and includes stops near Eur, St. Pauls Outside the Walls (Basilica S. Paolo), Piramide (also the Ostiense train station), Circus Maximus, the Coliseum and the Tiburtina train station. There will be signs in both the station and on the train showing the stops along the route. Your ticket will be validated when going through the turnstile. Those with passes can walk through the open lane while showing their pass to the attendant.



Rome useful numbers

Emergency and Security

Italian Road Rescue 803 116

Road Police +39 06 67691

Hospital +39 0649971

Police 112

Ambulance 118

Fire Brigade 115

Police, Ambulance and Fire Brigade are costless.

Transports

Airports of Rome Inc. +39 06 65951

Rome Subway +39 06 57531

Italian Railways Inc. 892 021

Rome Buses and Trams 800 431784

Rome Taxis +39 06 5551

Public Utility

Change Bureau +39 06 722821

Lost and Found Office (Bus) +39 06 5816040

Lost and Found Office (Subway) +39 06 57532264

History of Rome

The glorious Roman civilization had its origins in small groups of farmers and shepherds who settled along the banks of the Tiber, on the Palatine hills and the surrounding areas.

The most famous myth regarding Rome's origins recounts that the Trojans escaped from their ruined city of Troy, with Aeneas as their guide, they reached Lazio, settled there and intermarried with the Latin people. Ascanius, son of Aeneas, founded Albalonga, his ancestor, Amulius took the throne from his older brother, Numitore and forced his daughter Rhea Silvia to become a vestal virgin. However Silvia was loved by the god Mars and bore him twin sons, Romulus and Remus, who were thrown into the Tiber.

The twins survived and were washed up close to the Palatine hills. A she-wolf raised the newborn babies, who were later found and adopted by a shepherd and his wife. An argument between the two brothers over who was to be the founder of the city was decided when Romulus murdered his brother and Rome is said to have been established in 753 BC.

The Roman republic was characterized by internal struggles that eventually led to the success of the plebeians (lower class Romans) and a new order of ruling class. The city expanded and gradually, the whole of Lazio, the Italic peninsula and the Mediterranean basin were conquered. For almost four centuries, Rome concentrated her energies on building a strong, solid empire. Mighty conquests came thick and fast: from Sannitic and Tarantine wars, to clashes with Carthage and Syracuse. Rome expanded over land and sea and managed to accomplish what no other civilization had managed i.e. the unification of the East and West.

In the first two centuries of the empire, Rome reached the height of her power, but the first signs of her downfall were already apparent towards the end of the second century. The imperial age opened with a long period of peace and the unity of the empire was secure during the period between Emperors Octavian and Caracallus, however, this unity became increasingly unstable and eventually dissolved.

The fall of the Roman Empire is dated 476 BC. The causes of Rome's decline are numerous: the empire was unable to control her many subjects, social and economic changes made for an unstable climate as did the forceful arrival of the Barbarians. Christianity also began to spread and emperors tried to unite the empire using religion. Emperors wanted to have their titles sanctified and became Holy Roman Emperors.

Emperor Constantine sanctioned the freedom and tolerance of Christians in the empire in his edict of 313 but he unwisely decided to move the capital of the empire to Constantinople undermining the empire's power. The pontificate was re-

established in Rome with Gregory XI in 1377. The power of the Popes increased, they were able to assign public offices, which led to clashes and schisms.

The centralizing of the papacy and the power absolute that the church had made a cultural impact. Rome became the centre of artistic life. The face of the city changed, as palaces, villas, piazzas and churches were built. New streets were created and the basilica of Saint Peter was restored. The sack of Rome occurred in 1527, and although the effects were disastrous (all the artists abandoned the city), the wounds were soon healed and a new spirit of rebirth and development enveloped the city. More new districts and streets

were created and the population began to move back to the city.

In the 17th century, Rome also had a period of expansion and beautification, largely due to the work of two major artists, Gian Lorenzo Bernini and Francesco Borromini. Clashes continued between the nobility and the populace. Rome's fortune waxed and waned under Napoleonic rule: the church's estates were confiscated and divided amongst French officials and Italian laymen. The city was subject to French rule until the fall of Napoleon III and the annexation of Italy.

Rome became the capital of Italy in 1870 and the city received a huge influx of immigrants; this led to the rapid, and disordered creation of new dwellings. The situation did not become any better with the advent of fascism. During WWII, the city was bombarded heavily by America, causing major damage, particularly in the areas of Verano and Porta Maggiore. The city was attacked during the period of German occupation until the end of the war. From June 2, 1946 Italy chose to be a republic, ousting its monarchy and Rome was chosen as the capital.

Tourist Information



It's hard to describe Rome in a few words; a city so vast and rich in art, monuments and exquisite views, a historic city, which has preserved its charm and independence throughout the centuries. Rome's history can be read in every monument, and palazzo; in fact, each and every stone bears witness to the periods of splendour, decay, wars, and numerous architectural styles. The city could be described as a gigantic open-air museum, visited each year by millions of tourists, scholars and pilgrims from all over the world.

It is hard to believe that Roman civilization began with a small settlement of shepherds and farmers near the Tevere river, on Palatino (one of the seven hills on which Rome was built and where most of the Roman archaeological treasures were found), tradition dictates that this is where Romulus founded the city and where Augustus, the first Emperor, built his house, which is now widely (and incorrectly) known as the house of Livia, his wife.

The city extended over six other hills: Quirinale, Viminale, Esquilino, Celio, Aventino and Capitolino.

Quirinale, the highest of the seven hills, has Piazza Omonima on its summit, with its colossal statues of the gods, Castor and Pollux and the Palazzo del Quirinale, where the president lives. Opposite the Palazzo are the Scuderie, which have only recently been opened to the public, thanks to the architect Gae Aulenti, who created a functional exhibition space inside the building.

Viminale stands next to Quirinale, it is smaller in size, split into two by Via Nazionale, and dominated by the huge Palazzo delle Esposizioni building (designed by Pio Piacentini) on Piazza della Repubblica, near Rome's principal railway station, Stazione Termini. Piazza della Repubblica is one of the most beautiful piazzas in Rome, surrounded by arches. The recently restored Fontana delle Naiadi, takes pride of place in the centre of the square.

Esquilino is the home of the great poets Virgilio and Orazio. It has three peaks, one of which is Monte Oppio, where you can find the ruins of Domus Aurea, only recently opened to the public after years of restoration. Initially, Esquilino was a suburb of Rome, which is the reason for the nickname 'exquilini' (non-tenants) given to its inhabitants, some believe that this is how the hill got its name.

Further south stand Celio and Aventino, the former has a long promontory, called Monte delle Querce, as it was once home to many oak trees (querce). It is possibly the greenest and most charming of the seven hills and is home to Parco del Celio and Villa Celimontana. There are many beautiful buildings here, especially along the magnificent Via Appia Antica almost all are places of worship. Both Aventino and Celio have few inhabitants. Aventino is rich in important medieval monuments (such as the S.Maria in Cosmedin basilica, where the famous Bocca della Verita').

Last but not least, is Capitolino, which stands between Palatino and Quirinale: this used to be the religious and political centre of the city during the Roman era. It is dominated by the Michelangelo style Piazza del Campidoglio, perfectly proportioned, with a statue of Emperor Marcus Aurelius on horseback in the centre. The Capitolino museum has some of the most precious art collections in the world.

The seven hilltops offer a number of beautiful views; the most breathtaking of these are Pincio, the dome of San Pietro and the Gianicolo.

Rome has spread outwards in a rather haphazard manner, without much regard to town planning; many fields were acquired by the local authorities and transformed into new neighbourhoods. North of Rome, near the Vatican are the Aurelio, Prati and Mazzini neighbourhoods, which are more commercial and residential, as well as the elegant quarters of Parioli and Nomentano, home to many foreign embassies.

Further south are Prenestino and Tiburtino, more populated areas, due to the fact that they are university areas, full of students, who can also be found in the nearby S.Lorenzo, a charming district with wide variety of pizzerias and bars. Trastevere is undoubtedly one of the most charming areas of the city, it is also one of the most crowded areas too, especially on summer evenings. Many people (foreigners and Romans alike) want to live in this highly desirable district. Finally, the Eur, is one of the most modern neighbourhoods, a centre for offices and administration centres.

The Forum Romanum



The Forum Romanum was the center of life in imperial Rome, evidenced by the many remains of triumphal arches, temples and basilicas. Until 509 BC, when Rome became a republic, the city was reigned by an Etruscan dynasty of Tarquin Kings. They built a sewer, the 'Cloaca Maxima', to drain water from the marshlands of the valley between the [Palatine](#), [Capitol](#) and Esquiline hills to the Tiber river. Ever since, the area was the center of activity in Rome. It was the site of the first forum. Here, triumphal processions took place, elections were held and the Senate assembled

The Forum Romanum Today

Today, the forum known as the Forum Romanum can look like a

disorderly collection of ruins to the uninitiated, but with some imagination you can see the Roman empire come back to life at this site. Remains of many buildings from different periods are visible; the forum was littered with temples, basilicas and triumphal arches.

Colosseum



The Colosseum is probably the most impressive building of the Roman empire. Originally known as the Flavian Amphitheater, it was the largest building of the era.

The monumental structure has fallen into ruins, but even today it is an imposing and beautiful sight.

The Flavian Amphitheater

Emperor Vespasian, founder of the Flavian Dynasty, started construction of the Colosseum in AD 72. It was completed in AD 80, the year after Vespasian's death. The huge amphitheater was built on the site of an artificial lake, part of Nero's huge park in the center of Rome which also included the Golden House (Domus Aurea) and the nearby Colossus statue. This giant statue of Nero also gave the building its current name.

The Building

The elliptical building is immense, measuring 188m by 156m and reaching a height of more than 48 meter (159 ft). The Colosseum could accommodate some 55,000 spectators who could enter the building through no less than 80 entrances.

Above the ground are four storeys, the upper storey contained seating for lower classes and women.

The lowest storey was preserved for prominent citizens. Below the ground were rooms with mechanical devices and cages containing wild animals. The cages could be hoisted, enabling the animals to appear in the middle of the arena.

Velarium

The Colosseum was covered with an enormous awning known as the velarium. This protected the spectators from the sun. It was attached to large poles on top of the Colosseum and anchored to the ground by large ropes. A team of some 1,000 men was used to install the awning.

Emperors used the Colosseum to entertain the public with free games. Those games were a symbol of prestige and power and they were a way for an emperor to increase his popularity.

Games were held for a whole day or even several days in a row. They usually started with comical acts and displays of exotic animals and ended with fights to the death between animals and gladiators or between gladiators. These fighters were usually slaves, prisoners of war or condemned criminals. Sometimes free Romans and even Emperors took part in the action.

Trevi Fountain



The Trevi Fountain is the most famous and arguably the most beautiful fountain in all of Rome. This impressive monument dominates the small Trevi square located in the Quirinale district. The Trevi fountain is at the ending part of the Aqua Virgo, an aqueduct constructed in 19 BC. It brings water all the way from the Salone Springs (approx 20km from Rome) and supplies the fountains in the historic center of Rome with water.

Construction of the Fountain

In 1732, Pope Clement XII commissioned Nicola Salvi to create a large fountain at the Trevi Square. A previous undertaking to build the fountain after a design by Bernini was halted a century earlier after

the death of Pope Urban VIII. Salvi based his theatrical masterpiece on this design. Construction of the monumental baroque fountain was finally completed in 1762.

The Fountain

The central figure of the fountain, in front of a large niche, is Neptune, god of the sea. He is riding a chariot in the shape of a shell, pulled by two sea horses. Each sea horse is guided by a Triton. One of the horses is calm and obedient, the other one restive. They symbolize the fluctuating moods of the sea.

On the left hand side of Neptune is a statue representing Abundance, the statue on the right represents Salubrity. Above the sculptures are bas-reliefs, one of them shows Agrippa, the general who built the aqueduct that carries water to the fountain.

The water at the bottom of the fountain represents the sea. Legend has it you will return to Rome if you throw a coin into the water. You should toss it over your shoulder with your back to the fountain.

Pantheon



Built more than 1800 years ago, the magnificent Pantheon building still stands as a reminder of the great Roman empire. With its thick brick walls and large marble columns, the Pantheon makes an immediate impression on visitors. But for its time the most remarkable part of the building is the more than 43 meter high dome. It was the largest dome in the world until 1436 when the Florence Cathedral was constructed. At the top of the dome is a large opening, the oculus, which was the only source of light.

The front portico has three rows of 8 columns, each one with a diameter of 1.5m. A huge bronze door gives access to the cylindrical building. Its diameter equals the interior height of 43,3m.

Originally a temple for all pagan gods, the temple was converted into a church in 609. The Pantheon now contains the tombs of the famous artist Raphael and of several Italian Kings. Its ecclesiastic interior design contrast with the temple's structural design, but the marble floor - which features a design consisting of a series of geometric patterns - is still the ancient Roman original.

Before the current Pantheon was built, two other buildings occupied the same site. The first one, a traditional rectilinear, T-shaped structure was built in 27 BC by the emperor Marcus Agrippa, son-in-law of the emperor Augustus. The temple was dedicated to the gods Mars and Venus. It burned down in AD 80 but was rebuilt by emperor Domitian. In AD 110 the building was struck by lightning and burned down again. In AD 118 emperor Hadrian commissioned for the Pantheon to be rebuilt but with a totally different, circular design. This time the Pantheon building would last much longer.

The most important problem the Romans faced during the construction of the Pantheon was the massive weight of the large dome. In order to support it without proper reinforcement as it is common today, the thickness of the walls gradually decreased as the height increased. The Romans also used a different type of concrete for the dome as for the walls. At the base very thick (6m, 20ft) walls were constructed. At the top of the dome, a lighter type of concrete was used and near the oculus it is only 7.5 ft or 2.3 m thick. The use of coffers in the ceiling and the opening at the top also helped reduce the weight of the dome.

The huge, 60 tons weighing columns used for the portico were quarried in Egypt. They were transported all the way to Rome using barges and vessels.

The columns support a pediment with an inscription attributing the Pantheon to Marcus Agrippa even though it was built by Hadrian.

The Pantheon borders the Piazza della Rotonda, a rectangular square with a central fountain and obelisk. The often crowded square is situated in the historic center of Rome, not far from the Piazza Navone, one of Rome's most beautiful squares

Spanish Square



The Spanish Square is connected to a French church (Trinità dei Monti) on top of the hill via a long staircase, known as the Scalinata della Trinità dei Monti or Spanish Steps. The idea of connecting the church with the square below originates from the 17th century, when the French also planned a statue of King Louis XIV of France at the top of the staircase. Papal opposition caused the plans to be shelved until 1723, when the monumental staircase was built without the statue. Pope Innocent XIII appointed the Italian architect Francisco de Sanctis. He presented a design that satisfied both the French and the papacy. The elegant staircase consists of 137 steps over twelve different flights.

It has an irregular albeit symmetric structure. It is especially beautiful in May, when it is decorated with azaleas. The steps are usually very crowded; it attracts tourists as well as locals who use it as a gathering

place.

At the bottom of the Spanish Steps is the Piazza di Spagna or Spanish square. The long, triangular square is named after the Spanish Embassy to the Holy See. In the 17th century, the area around the embassy was even considered Spanish territory

Barcaccia's Fountain

At the foot of the Spanish Steps is the Barcaccia's Fountain, a sober fountain commissioned by Pope Urban VIII and designed by Gian Lorenzo Bernini. The design, a small boat, was inspired by the flooding of the Tevere in 1598, when a small boat stranded here after the water subsided.

Trinità dei Monti

The Trinità dei Monti is a beautiful French church located on a hill overlooking the small piazza della Trinità dei Monti. From this square, you have a nice view over Rome. At the end of the 15th century, only a small chapel existed on the hill. In 1495, French King Louis XII commissioned the erection of a new church, replacing the chapel. Construction started in 1502 and dragged on for decades. It was only consecrated in 1585 by Pope Sixtus V. The gothic church with a renaissance facade has two bell-towers. Inside, several paintings decorate the different chapels. Among them are two works by Daniele da Volterra, a pupil of Michelangelo. Its location on top of the Spanish Steps make the Trinità dei Monti a well-known landmark in Rome. The obelisk just in front of the church was originally located in the Gardens of Sallust. In 1788 it was moved to its current location on request of pope Pius VI. The hieroglyphs were copied from the obelisk on the Piazza del Popolo.

Colonna dell'Immacolata

In the southeast part of the square is the Colonna dell'Immacolata (column of the Immaculate conception). It was erected in 1857 to commemorate the dogma of the immaculate conception. The column was found in 1777 under a monastery. It is now topped with a statue of Virgin Mary.

Piazza Navona



Piazza Navona is one of the most famous and arguably the most beautiful of Rome's many squares. The large and lively square features no less than three magnificent fountains. Another eyecatcher is the baroque church of Sant'Agnese in Agone.

The square is built on the former Domitian's stadium, built by emperor Domitian in 86 AD. Hence the long, oval shape of the square.

The stadium, which had a larger arena than the Colosseum was mainly used for festivals sporting events. The stadium was known as 'Circus Agonalis' (competition arena). It is believed that over time the name changed to 'in agone' to 'navone' and eventually to 'navona'.

In the 15th century the stadium was paved over to create the Navona square, but remnants of Domitian's stadium are still visible around the area. Guided

tours to this underground monument are available, they start at the Piazza Tor Sanguigna 13. The main attraction of the Piazza Navona are the three fountains. The central and largest fountain is the Fontana dei Quattro Fiumi (fountain of the four rivers). It was constructed between 1647 and 1651 on request of the Pope Innocent X.

The design of the fountain was first commissioned to Borromini, but it was ultimately handed to his rival Bernini. The fountain features four figures, each representing a river from a different continent - the Nile, Ganges, Danube and Rio della Plata. The statues are at the base of a rock supporting an obelisk, originally located at the Massenzio Circus, near the Via Appia Antica. The two other fountains on the piazza are the Fontana di Nettuno (Neptune fountain) at the northern end and the Fontana del Moro (Moor fountain) at the southern end.

The Fontana del Nettuno, also known as the Calderari, was built in 1576 by Giacomo della Porta. The statues, Neptune surrounded by sea nymphs were added in the 19th century. Giacomo della Porta also built the Fontana del Moro. The central statue of a Moor holding a dolphin, a design by Bernini, was added in the 17th century. The tritons are 19th century additions.

Another highlight on the Navona square is the church of Sant'Agnese in Agone. It was commissioned in 1652 by Pope Innocent X and built on the site where according to legend, St. Agnes was stripped naked, but miraculously saved from disgrace by extraordinary growth of hair. The front façade of the baroque church was designed by Borromini, Bernini's main rival. Construction started just two years after the completion of Bernini's Fontana dei Quattro Fiumi, right in front of the building. The church was finished in 1670.

St. Peter's Church



The first St. Peter's Basilica was ordered built by the emperor Constantine in the 4th century A..D.on the site of the Apostle's tomb. Begun in 315 and completed in 349, the basilica was a splendid building with five naves, rich with mosaics, frescoes and work's of art. In the 15th century, after over a thousand years, it had fallen into such precarious conditions that in 1452 Pope Nicholas V decided to have it rebuilt, though work was not begun until 1506 with Pope Julius II. The task was assigned to Bramante, who created a design in the form of a Greek cross. A few years later Bramante died and leadership of the work was taken over by Giuliano da Sangallo, Raffaello, B. Peruzzi, and Michelangelo in 1546, who returned to the original design by Bramante

and conceived a building in the form of a Greek cross dominated by an enormous cupola. Upon his death (1564) the work was carried on by Vignola, Pirro Ligorio and, for the cupola, by Giacomo della Porta. Following the desire of Pope Paul V , Carlo Maderno later changed the Greek cross form into a Latin cross, extending the front arm by adding three more chapels, and built the facade. On the 18th of november 1626 Pope Urban III consecrated the new basilica.

A sacred setting,uniquely evocative and imbued with profound religious and symbolic connotations: Saint Peter's is perhaps the most famous square in the world. Since the Middle Ages it has welcomed and been a gathering place for countless multitudes of pilgrims come to visit Saint Peter's Basilica, the Center of Christianity, offering a vital space for the functions of the religious life of the city. The square was built over a part of the ancient Vatican Circus (or Nero's Circus, though actually built by Caligula), of which there remains the so-called "Vatican Obelisk", transported here in 37 BC from Alexandria, where it decorated Caesar'a Forum. Called in medieval times the aguglia, it stood at length beside the basilica, until 1596, when Sixtus V ordered Carlo Maderno to move it to its present site. In 1613, Paul V bid the same Maderno build a Fountain to its right, half a century later, a twin fountain by Carlo Fontana, placed symmetrically with respect to the first, was added. Again under Sixtus V, the original bronze globe that topped the obelisk (today in the Capitoline museums) and that was believed to contain the ashes of Caesar was replaced with that pope's family emblem, the mountais and the star, topped by a crucifix containing a fragment of the Holy Cross of Christ's Crucifixion. In the mid-17th century, when the monumental work of rebuilding Saint Peter's Basilica was well-delineated, attention naturally shifted to the square before it. The fervent activity then being concluded provided the impetus for the sumptuous design of the square, which was built by Gian Lorenzo Bernini between 1656 and 1667. The triumphant spectacular feeling that through the genius of the Baroque architete and sculptor emerged in the execution of this immense masterpiece was not entirely dictated by artistic considerations, the design was also imbued with profound symbolic significance, to the point that the entire opus may be interpreted as a monumental allegory. The great portico that branches out from the facade of the basilica to form two hemicycles delineated by a double row of Tuscan columns supporting an entablature animated by a procession of statues of saints and the immense coats of arms of Alexander VII°, under whose pontificate the opus was realized, is a symbolic embrace by the Church that would welcome and protect all the faithful of the world in thi and in

the next life. The vast elliptical space (240 meters in width), so theatrically defined by the two hemicycles, is possessed of many symbolic references. Arisen as the last forum of Rome and dedicated to Christianity, it owes its form to that of the circuses of the ancient Urbe, and in particular to the Colosseum, the square may thus be said to play the role of historical trait-d'union between the early Church, persecuted in the figure of the martyrs who in the amphitheatres were put to death, and the glory of the Church triumphant, in which Christ and the saints portrayed in the statues are participants. But the elliptical form is also evocative of the firmament, in which according to the theory of Copernicus, coeval with construction of the square, the planets describe such orbits, and of the Universe, understood as the space-time dimension in which the obelisk, which stands at the geometrical center of the ellipse and is the gnomon of an immense sundial, symbolizes the sun itself and alludes to the central figure of the pope, the Vicar of Christ on Earth.

Castel Sant'Angelo



The Mausoleum of Hadrian, usually known as the Castel Sant'Angelo, is a towering cylindrical building in Rome, initially commissioned by the Roman Emperor Hadrian as a mausoleum for himself and his family. The building was later used as a fortress and castle, and is now a museum.

A view of Rome from atop the castle. Saint Peter's Basilica can be seen on the far left. The tomb of the Roman emperor Hadrian was erected on the right bank of the Tiber, between 135 and 139. Originally the mausoleum was a decorated cylinder, with a garden top and golden quadriga. Hadrian's ashes were placed here a year after his death in Baiae in 138, together with those of his wife Sabina, and his first adopted son, Lucius Aelius, who also died in 138. Following this, the remains of succeeding emperors were also placed here, the

last recorded deposition being Caracalla in 217. The urns containing these ashes were probably placed in what is now known as the Treasury room deep within the building. Hadrian also built the Pons Aelius facing straight onto the mausoleum – it still provides a scenic approach from the center of Rome and the right bank of the Tiber, and is renowned for the Baroque additions of statuary of angels holding aloft elements of the Passion of Christ.

Much of the tomb contents and decoration has been lost since the building's conversion into a military fortress in 401 and inclusion by Flavius Augustus Honorius in the Aurelian Walls. The urns and ashes were scattered by Visigothic looters in Alaric's sack of Rome in 410, and the original decorative bronze and stone statuary was thrown down upon the attacking Goths when they besieged Rome in 537, as recounted by Procopius. An unusual survival, however, is the capstone of a funerary urn (most probably that of Hadrian), which made its way to Saint Peter's Basilica and was recycled in a massive Renaissance baptistry. That spolia from the tomb had been used in the post-Roman period was already noted in the 16th century - Giorgio Vasari writes: *Verschaffelt's replacement...in order to build churches for the use of the Christians, not only were the most honoured temples of the idols [ie pagan Roman gods] destroyed, but in order to ennoble and decorate Saint Peter's with more ornaments than it then possessed, they took away the stone columns from the tomb of Hadrian, now the castle of Sant'Angelo, as well as many other things which we now see in ruins.*

Legend holds that the Archangel Michael appeared atop the mausoleum, sheathing his sword as a sign of the end of the plague of 590, thus lending the castle its present name.

Leo X built a chapel with a fine Madonna by Raffaello da Montelupo. In 1536 Montelupo also created a marble statue of Saint Michael holding his sword after the 590 plague (as described above) to surmount the Castel.[2] Later Paul III built a rich apartment, to ensure that in any future siege the Pope had an appropriate place to stay.

The Papal state also used Sant'Angelo as a prison; Giordano Bruno, for example, was imprisoned there for six years. Executions were made in the small interior square. As a prison, it was also the setting for the third act of Giacomo Puccini's *Tosca* from whose ramparts the eponymous heroine of the opera leaps to her death.

Decommissioned in 1901, the castle is now a museum, the Museo Nazionale di Castel Sant'Angelo.

The Castel Sant'Angelo is well known as it appeared in many art works. It was the central scene of the "Tosca" opera, appeared in Dan Brown's 2000 novel *Angels and Demons* (The location was the secret lair for the Assassin and is the last existing church of the Illuminati).

The castle appeared in the film *Roman Holiday* in a scene taking place on barges on the river below.

In Eric Flint's alternative history novel *1635: The Cannon Law*, the castle is the scene of intense fighting, and is largely destroyed.

For booking and information:

Situated in Lungotevere Castello, 50

Ticket office number is: (+39) 06 6896003

Opening Hours: Tuesday - Sunday 9.00 a.m. – 07.30 p.m.

Monday: closed

Ticket office closes at 6.30 p.m.

Museums and Galleries

Rome can count on a wide number of museums and art galleries, among the most important and rich in the world. The truth is that the Italian capital can be considered as a real open air museum, thanks to the excavations that brought to light the splendours of ancient Rome. Here you can find a list of the main art galleries and museums where you can admire from Roman and Greek masterpieces to Renaissance and Baroque paintings and sculptures.

- Vatican Museums
- The Vatican Museums are probably the most important museums of Rome. At their inside the highest piece is the Sistine Chapel, famous because of the Last Judgement fresco realized by Michelangelo. The pieces that belong to the museum are so many that several hours are necessary to visit it entirely.

For booking and information:

Opening hours: From Monday to Saturday from 9.00 a.m. to 4.00 p.m.

- Capitoline Museum
- Opened in 1734, the Capitoline Museums are among the most ancient of the world and inside are exposed artworks from very different times and styles like the statue of the she-wolf symbol of Rome, Bernini's Baroque statues and precious paintings of Tintoretto and Caravaggio.

For booking and information:

Situated in Piazza del Campidoglio 1

Ticket office number is: (+39) 06- 0608

Opening hours: From Tuesday to Sunday from 9.00 a.m. to 8.00 p.m.

Ticket office closes 1 hour before Museum's closing

- Borghese Gallery
- In the art gallery held at the magnificent Villa Borghese are kept many works of great artists as Caravaggio, Da Vinci, Raffaello and Tiziano dating back to the period between 15th and 18th century.

For booking and information:

Situated in Piazzale del Museo Borghese 5

Ticket office number is (+39) 06 8413979 -(+39) 06 32810

Opening hours: from Tuesday to Sunday: from 8.30 a.m. to 7.30 p.m.- Monday: closed

Access up to half hour before the closing time

- Doria Pamphili Gallery
- Masterpieces of Caravaggio, Guercino, Caracci and many other great masters of 1600 are preserved at the Doria Pamphili Art Gallery, as well as renaissance works belonging to Raffaello and Tiziano.

For booking and information:

Situated in Via del Corso, 305

Ticket office number is (+ 39) 06 6797323

Opening hours: Monday-Sunday 10.00 a.m. - 5.00 p.m.

Ticket office closes at: 16:30

- National Ancient Arts Gallery
- Hosted in Palazzo Barberini, wonderful building planned by architect Maderno and finished by Bernini, the Ancient Art Gallery is one of the most prestigious museums of Rome, where are kept masterpieces of great artists such as Caravaggio and Raffaello.

For booking and information:

Situated in Via delle Quattro Fontane, 13

Ticket office number is (+39) 06 32810

Opening hours: Tuesday to Sunday, from 8.30 a.m. to 7.00 p.m.

Ticket office closed 1 hour before Gallery's closing

Shopping in Rome

While you're visiting the famous Spanish Steps, walk straight on onto **Via Condotti** where you will find designer shops with famous names like Armani, Gucci, Dolce & Gabbana, Furla and Prada and if you're fancy of jewelry, visit Bulgari, Cartier and others also found on Via Condotti. You may also take in some window shopping, equally enjoyable while taking a leisurely stroll along this pedestrian street, because there are many delightful shops to experience with reasonable prices around every corner. If you want to start off your shopping on a more reasonable budget, get onto **Via Frattina**, a lovely and picturesque pedestrian street also starting at the Spanish Steps parallel to Via Condotti. Here you will find an assortment of shops from clothing to specialty shops blending in with the picture postcard Roman architecture that some people wait a lifetime to see. **The square of the Spanish steps** also contributes its share of souvenirs for the visitor with items ranging from drawings, done on the spot, to jewelry and much more.

If you find yourself in Piazza del Popolo or Piazza Venezia, get onto **Via del Corso** for some more of Italy's best like Diesel, Benetton and Stefanel, to name a few, aiming at the younger consumer. Because the centre of the Catholic Church, the Vatican State, is situated in Rome, in the area around St. Peter's Basilica you will find shops where you can enjoy all kinds of religious artefacts. The nearby **Via Cola di Rienzo**, starting at Piazza Risorgimento is also an excellent shopping area for leather goods and women's clothing.